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Supplement to Draft Environmental Impact Report

Embarcadero Office Terraces

82.129E

Supplement Publication Date: March 1, 1985

Supplement Comment Period: March 1, 1985 through April 1, 1985

Written Comments on this material only should be sent to the
Environmental Review Officer
450 McAllister Street, Fifth Floor, San Francisco, CA 94102

Please note: There will be no public hearing on this supplement.

DEIR Publication Date: September 16, 1983
DEIR Public Comment Period: September 16, 1983 to October 20, 1983
DEIR Public Hearing Date: October 20, 1983

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DEPARTMENT OF CITY PLANNING 450 McALLISTER STREET · SAN FRANCISCO, CALIFORNIA 94102

March 1, 1985

MEMORANDUM

To: Interested Parties

From: Alec S. Bash, Environmental Review Officer

Re: 82.129E - EMBARCADERO OFFICE TERRACES, SUPPLEMENT TO DRAFT ENVIRONMENTAL IMPACT REPORT, AND PROCEDURES FOR COMMENT

A Draft Environmental Impact Report (DEIR) was published September 16, 1983, on the proposed Embarcadero Offices Terraces building; a public hearing was held on the DEIR on October 20, 1983. Since the public hearing, the Department of City Planning has revised its list of projected cumulative development in the Downtown (March 10, 1984). In addition, on March 16, 1984, the Department published the Downtown Plan DEIR (EE81.3, FEIR certified October 18, 1984).

This Supplement updates the Embarcadero Office Terraces DEIR cumulative analyses to March 1984, describing results of analyses in the Downtown Plan EIR as well as results of cumulative analysis using the list-based method. The Supplement presents revised analyses of cumulative effects under the categories of transportation, air quality, housing, office space and energy. It also includes revised analysis of project-specific impacts on transportation and Historic and Cultural Resources, and a preferred alternative. Subjects not included in the Supplement were either focused out of the DEIR or are not affected by changes in cumulative development project or cumulative analysis methodology.

Written comments on this Supplement will be accepted through the close of business April 1, 1985. Comments on matters other than those contained in the Supplement will not be accepted. PLEASE NOTE THAT COMMENTS MUST BE SUBMITTED IN WRITING. THERE WILL BE NO PUBLIC HEARING ON THE SUPPLEMENT. Please address comments to Alec S. Bash, Environmental Review Officer, Department of City Planning, 450 McAllister Street, 5th Floor, San Francisco, CA 94102. Attention: Carol Roos.

Written comments on the Supplement will be incorporated with comments previously received during the DEIR public comment period, and the Comments and Responses will be presented to commenters and the City Planning Commission prior to consideration by the Commission of certification of the EIR.

DEPARTMENT OF CITY PLANNING 450 McALLISTER STREET · SAN FRANCISCO, CALIFORNIA 94102

City and County of San Francisco
Department of City Planning

Supplement to the
Draft Environmental Impact Report

Embarcadero Office Terraces
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Written comments, on this material only, should be sent to the Environmental Review Officer, 450 McAllister, 5th Floor, San Francisco, California 94102.

PLEASE NOTE: There will be no public hearing on this Supplement.

DEIR Publication Date: September 16, 1983
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I. INTRODUCTION

This report supplements and updates the cumulative impact analysis in the Draft Environmental Impact Report published September 16, 1983 (hereinafter DEIR). The revised analysis of the cumulative effects of downtown office development and/or the proposed project is contained in the land use, transportation, air quality, energy and housing sections. Under each topic discussed, text that has been added or replaced is identified. A new sponsor preferred alternative (Alternative Eight) is also included as well as updated archaeological information and project-specific transportation impacts. Not all material is new. Some material included in the Embarcadero Office Terraces DEIR is referenced or repeated here for clarity. Subjects not covered in this Supplement were either focused out of the DEIR as not having significant environmental effects, or are not affected by changes in the cumulative development projections for downtown San Francisco or cumulative methodology: Zoning; Visual Quality and Urban Design; Employment and Fiscal Factors; Climate; Geology, Hydrology and Seismicity; Noise; Utilities and Public Services; Hazards; Biology; and Alternatives.

Cumulative analysis in the Embarcadero Office Terraces DEIR was based upon approximately 18.4 million square feet of net new office space under formal review, approved, under construction or recently completed as of June 1, 1983. Cumulative analysis in this Supplement is based upon approximately 19 million square feet of net new downtown office space. This includes projects as of March 10, 1984 under formal review by the Department of City Planning, or approved, or under construction within the greater downtown area. The process used to develop the cumulative list and the list of projects itself appears in Appendix F, pages A-51 - A-61 of this document. This list contains the most recent cumulative development projections prepared by the Department. Project travel demand calculations were assessed in the published DEIR using Guidelines for Environmental Evaluation: Transportation Impacts, prepared by the San Francisco Department of City Planning, July 1983. This Supplement uses the September 1983 revised edition of these Guidelines; therefore, the number of project person-trips is slightly greater (an increase of 105 person trips or 4%) than shown in the DEIR.

In addition to updating the DEIR to reflect revised cumulative development projections, this Supplement also presents a revised cumulative analysis of the transportation, air quality, energy and housing impacts of the project using the forecast methodology developed for the Downtown Plan EIR (FEIR certified October 18, 1984). The Downtown Plan forecast approach presents cumulative scenarios for C-3 district (downtown core) land use change, employment growth and residence patterns between 1984 and 2000, for the Downtown Plan and Five Alternatives. Integrated into the forecasts are analyses of policies affecting the size, cost and location of new development, in the context of underlying local and regional economic conditions influencing the need for space. Appendix E, pages A-48 - A-50 of this report, highlights the differences between the list-based approach and the Downtown Plan forecast approach. In summary, the Downtown Plan EIR cumulative analysis methodology differs from recently certified EIR's for downtown office projects in that the cumulative analysis in those EIR's were based on the projected number of square feet of cumulative development, whereas that in the Downtown Plan EIR is based on projected employment.

The project site is located in a C-2 district, six blocks north of the northernmost C-3 district boundary. Although the Downtown Plan EIR was prepared for the downtown core, where appropriate areas outside the C-3 district were included. For example, calculations made for non-C-3 travel presented in the Downtown Plan EIR encompass development in the project area and thus the effects of the project. Therefore, data based on the Downtown Plan EIR is presented.

The project description presented in paragraphs one and two of the Summary, p. 1 of the DEIR, is repeated here for the reader's convenience:

"The proposed Embarcadero Office Terraces would be a mixed-use development containing primarily office space with restaurant space and parking. The project site is located at 1000 Front Street, bounded by The Embarcadero, Green Street, Front Street and Union Street. The site is located in Assessor's Block 110, Lot 1 and has an area of approximately 46,200 square feet. The property is owned by the Port of San Francisco and would be leased by the project sponsor. The project sponsor, Seawall Lot 321 Limited Partnership desires to provide an office building with restaurant space that would make a positive contribution to the City and yield a return on investment while complying with the Port's land use objectives and the terms of the ground lease granted by the City for the project site.

"The proposed project would consist of a 40-foot, four-story building containing approximately 189,000 total gross square feet including 139,000 gross square feet of office space and 3,000 square feet of ground-level restaurant space. Approximately 41,000 square feet in a basement level would provide 20,000 square feet of storage space and 50 parking spaces. The main entrance would be on Front Street with rear access from The Embarcadero via a publicly accessible garden court. Access to the one loading dock on the ground level and the subsurface parking facilities would be from Green Street. The project would require a variance for exception to the off-street parking requirement of 256 spaces."

II. SUMMARY

The following text is added before the first paragraph on page 2 of the Embarcadero Terraces DEIR, introducing the environmental impacts section of the summary:

"The cumulative impact analyses in this EIR present results of two different methods of analysis: the list-based approach employing a list of projects in the greater downtown area as of March 10, 1984, and the Downtown Plan EIR forecast approach. (The process used to develop the List of Cumulative Office Development in Downtown San Francisco appears in Appendix F, pages A-61 through A-70A [pages A-51 through A-61 of this supplement]. Although the Downtown Plan EIR was prepared for the downtown core (C-3 district), it also projected non-C-3 travel. It may be assumed that many employees travel and residential pattern characteristics would be similar for areas near, but outside of, the downtown. (The project site is located in a C-2 district, six blocks north of the C-3 district boundary.)"

The following text replaces the second paragraph of the Employment, Housing and Fiscal Considerations summary on page 3 of the DEIR:

"Using the list-based approach, about 230,000 workers (existing and new workers) in the greater downtown would live in San Francisco after build-out of the projects on the list. About 220 people working in the proposed structure would live in San Francisco, about 0.1 percent of the total.

"According to the Downtown Plan forecast, 189,000 C-3 district workers (existing and new) would live in San Francisco in 2000. The Embarcadero Terraces project is not included in this total because the project site is outside of the C-3 district (downtown core).

"Employment growth accommodated by the project and the other projects considered in either the list-based analysis or the Downtown Plan forecast has implications for the San Francisco housing market. These can be summarized as follows:

- There would be more people with preferences and increased resources to pay for San Francisco housing, adding to an already strong demand.
- The housing supply would be expanded in San Francisco. However, the private market is expected to continue to have difficulty producing affordable housing, for many housing market reasons.
- There would be increased competition for the available housing units. As a result, San Francisco housing prices/rents would be higher with continued employment growth than with a more stable labor force.
- Generally, households with fewer financial resources to pay for housing would make the most sacrifices in adapting to more competitive market conditions. San Francisco currently has, and will continue to attract, a large number of persons who would be faced with greater difficulty in obtaining housing.

"Cumulative employment growth in downtown San Francisco would have less impact in the context of the rest of the region's housing market. Considering trends in labor force participation, workers per household, housing production and employment growth throughout the region, future workers in downtown San Francisco would not require much larger shares of the region's housing stock in the future than they do now. In the future, the relationship between downtown workers and other workers competing for housing in the region would be relatively similar to current conditions. As part of total regional employment growth to the year 2000, increases in San Francisco employment can be viewed as contributing to regional housing demand and to a competitive regional housing market with relatively high housing prices and rents."

The following text replaces all four paragraphs of the Transportation, Circulation and Parking summary on page 3 of the DEIR:

"6. Transportation, Circulation and Parking

"Cumulative transportation impacts have been calculated by a cumulative-development, list-based method used in most past San Francisco EIRs, and by the forecast approach method first presented in the Downtown Plan EIR, certified October 18, 1984. The employment-based model used in the Downtown Plan forecast approach takes into account area-wide housing availability, planned transit system improvements, the effect of congestion on mode selection decisions and other factors that are expected to change with time, thus giving a more realistic and sophisticated prediction than the list-based method, which assumes no changes in modal split or residence patterns of San Francisco workers between now and the year 2000. The two methods are not directly comparable because the employment-based method analyzes C-3 (all uses) and non-C-3 district trips, while the cumulative-development list covers travel from only office and retail in the greater Downtown area.

"Net new trip generation from the project would be about 2,966 person-trip-ends (pte) per day. About 443 new outbound trips would occur during the p.m. peak period, 274 of these during the peak hour. On the basis of modal splits predicted for the year 2000 by the Downtown Plan EIR, the main peak-period (two-hour) project-generated trips would be: Auto - 121 trips, Muni - 103 trips, BART - 82 trips, other regional transit - 58 trips, walk only - 68 trips, and other - 10 trips.

"Muni lines 42 and 32 operate within walking distance of the project site. It is expected that the proposed project would increase peak hour ridership on the two lines by about 15%, which could be accommodated due to the excess capacity on the two lines. The project would generate an annual cost deficit to Muni of about $25,956, which would be offset through its contributions to the General Fund, the Transit Development Impact Fee, and sales tax revenues. The project would result in an annual net operating deficit to BART of about $77,465. BART's operating deficit per passenger is likely to decline in real terms as planned service improvements become operational in the future.

"The transit demand from the project would represent about 0.1% of the total transit demand in the year 2000. Planned capacity increases of transit carriers in conjunction with transit ridership increases from cumulative development under the Downtown Plan to the year 2000, would be expected to result in the following changes in transit levels of service during the peak period: Muni Northeast Corridor - D to C, BART Transbay - F to E, AC Transit - C to D, Golden Gate Ferry - B to A, Tiburon Ferry - B to C and CalTrain - B to C.

"About 0.1% of year 2000 Bay Bridge peak period demand would be expected to be due to the project. About 0.1% of peak-period demand on the Golden Gate Bridge, U.S. 101 (south of Harney Way), and I-280 (between Alemany Boulevard and San Jose Avenue) would be due to the project.

"The project would generate a parking demand of about 70 long-term and 14 short-term parking spaces, and would also result in the removal of a 269-space surface parking lot. The loss of the existing parking lot and parking demand generated by the project would increase surrounding parking occupancy from about 79% to about 93%.

"There would be about a one percent increase in traffic at the Broadway/Battery and Broadway/Sansome intersections and about a two percent increase at the Lombard/Sansome intersection. All of these intersections would remain in their existing levels of service with additional project traffic.

"Existing pedestrian flows on sidewalks and crosswalks are generally in the open range with virtually no pedestrian conflicts. The project would generate about 230 p.m. peak hour total pedestrian trips and about 345 total pedestrian trips during the peak midday hour. During the p.m. peak hour pedestrian flows would generally remain open but could worsen slightly to unimpeded during peak five-minute periods.

"Peak construction truck traffic would not exceed 50 trucks daily, with fewer than five trucks during the p.m. peak hour. Construction truck traffic would add less than one percent to streets such as Battery and Sansome and the traffic flow characteristics would not worsen as a result of the truck travel."

The following text replaces the first sentence of the Air Quality summary on page 4 of the DEIR:

"Traffic generated by cumulative development would increase the total regional burden of emissions in the Bay Area. This increase would not produce increases in ozone concentrations in the Bay Area, although it could produce small increases in ozone at locations further downwind. The project would produce about 0.8% of the air pollution generated by projects on the March 10, 1984 cumulative list, and about 2% of the total emissions generated by Downtown Plan development in 1990.

"Emissions of TSP generated by the project and by cumulative development would increase TSP concentrations, which could increase the frequency of TSP standard violations in San Francisco."

"Cumulative-development-generated traffic could also increase carbon monoxide (CO) emissions on local streets. However, because of ongoing state and federal emissions control regulations, these increases would not cause CO concentrations in future years to be higher than they are currently. Rather, CO concentrations would generally continue to decrease as older, more polluting vehicles are replaced by newer cars. CO concentrations in 1990 and 2000 predicted to exceed state and federal eight-hour standards at only one of 11 intersections in the downtown study area (Brannan and Sixth Streets) under the Downtown Plan and Alternatives. The project would contribute less than 1% to the total CO at the intersections studied."

The following paragraphs are added to the Energy summary on page 4 of the DEIR:

"Yearly estimated electrical consumption for the projected 19 million square feet of additional downtown office space at the time of buildout (mid-1990s) of the projects on the March 10, 1984 cumulative list would be approximately 340 million kilowatthours (kWh) of energy per year. PG&E projects an increase in annual energy demand over the next decade of about 200 million kWh. The lower PG&E estimate is largely due to a lower development estimate.

"The Downtown Plan EIR predicts an increase of about 210 million kWh of annual electrical consumption between 1984 and 1990, and of about 330-350 million kWh of annual energy consumption for the years between 1990-2000. The PG&E projections and

Downtown Plan EIR do not predict energy consumption for exactly the same time period and thus are not comparable."

The following paragraph is added to the C. Mitigation Measures summary on page 5 of the DEIR:

"Mitigation Measures that could be implemented by public agencies:

"Cumulative transportation impacts would be reduced if the City adopts and implements the transportation improvements outlined in the Downtown Plan. In the event that the Downtown Plan is not implemented, cumulative impacts on the transportation system could be reduced by City implementation of the transportation mitigation measures described in the Downtown Plan EIR."

The following is added to the D. Alternatives summary on page 8 of the DEIR:

"8. Redesigned Larger Building with 276 Parking Spaces.
"This sponsor-preferred alternative would contain 276 attendant spaces and a redesigned facade more similar to buildings in the Northeast Waterfront Historic District than the project. The alternative would contain 147,000 gsf of office space, 3,500 gsf of retail space, 130 parking spaces (276 spaces with attendant) and limited open space.

"Greater office space would result in a 7% greater travel demand than the project. Traffic-generated noise and air quality impacts would be increased but not by any mesaureable magnitude. The alternative would comply with the off-street parking requirement in number, but would require conditional use approval for attendant parking. The project sponsor prefers this alternative."

III. REVISED ENVIRONMENTAL SETTING

A. LAND USE

The following is added before the first sentence on page 22:

"a. Base of Telegraph Hill"

The following text replaces the first two sentences of the third paragraph on page 22 and Table 1, page 24 of the DEIR:

"Immediately south of the site, occupying the entire block at Front and Vallejo Streets, is the three-story 900 Front Street building. This building was formerly occupied by Master Charge, and is currently being renovated for another tenant. Directly southwest of the site is the 955 Front/55 Green office building. This building is categorized as under construction on the March 10, 1984 List of Cumulative Office Development in San Francisco (see Appendix F, Table F-2, page A-66 [page A-56 of this supplement]); construction has been completed. Table 1, page 24, [page 11 of this supplement] lists other planned or recent development in the area at the base of Telegraph Hill."

The following text is added following the second paragraph on page 25 of the DEIR:

"b. Downtown San Francisco and the Bay Area Region

"The Department of City Planning has compiled data on major office building construction citywide since 1960. (See Table F-3 in Appendix F.) According to the City's data, in 1983 there were 64.3 million gsf of space in major office buildings throughout the City. Most of this office space is in the C-3 district, the downtown core. Between 1960 and 1979, office space was built at an average rate of 1.4 million gsf per year. Recently, office construction activity has risen to higher levels. The data compiled by the Department of City Planning show 12.2 million gsf built from 1980 through 1983, for an average rate of about 3.0 million gsf per year.

TABLE 1

OFFICE DEVELOPMENT IN THE BASE OF TELEGRAPH HILL[1]

		Gross Square Feet	
Projects Under Formal Review[2]		Total New Construction	Net New Construction
1620 Montgomery (83.177E)		82,270	45,390
Embarcadero Terraces (82.129E)		139,000	139,000
1100 Sansome (83.447E)		55,000	48,000
220 Green (8264603)		3,520	3,520
	Subtotal	279,790	235,910
Projects Approved/Under Construction			
Ice House Conversion (C) (81.258)		209,000	209,000
Roundhouse (C) (82.234E)		45,000	45,000
955 Front/55 Green (81.243E)		50,000	50,000
1000 Montgomery (C) (81.353ED)		39,000	39,000
	Subtotal	343,000	343,000
Projects Completed But Not In Base Case Analysis			
1299 Sansome (81.451ED)		41,000	41,000
100 Broadway (81.151EV)		13,000	13,000
	Subtotal	54,000	54,000
	TOTAL	676,790	632,910

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[1] As of March 10, 1984; see Appendix F, A-61 [page A-51 of this supplement]

(C)= Conversion from a use other than office.

[2] A project was proposed at 1171 Sansome Street containing 30,000 gsf of net new office space and is included in the March 10, 1984 list of projects. However, the project was disapproved by the City Planning Commission. New development could be proposed for the site and there has been some discussion of a smaller development on the site. At this time, it would be speculative to assume one proposal or another.

Source: San Francisco Department of City Planning

"The Department of City Planning maintains a list of cumulative office development in downtown San Francisco. (See Table F-2 and Appendix F text for a more detailed description of the contents of the list.) The list incorporates all office and major retail projects that are under formal review, approved but not yet under construction, and under construction in the greater downtown area. This area covers the C-3 district in addition to adjacent areas, such as the Northern Waterfront (including the project area), Civic Center and the area south of Folsom Street. As of March 10, 1984, about 9.2 million gsf were under formal review, about 5.0 million gsf were approved and about 5.7 million gsf were under construction. In total, the list includes a net addition of about 19.9 million gsf: 19.0 million gsf of office space and 0.9 million gsf of retail space. The information on the list for the net addition of space accounts for about 2.7 million gsf of existing office and retail space that would be demolished for construction of these projects. About 13 million gsf of the 19.9 million gsf total are in projects located in the C-3 district. About 633,000 gsf of the 19.9 million gsf total are in projects in the Base of Telegraph Hill area, as shown in Table 1.

"Forecasts of development between 1984 and 2000 prepared for the Downtown Plan EIR (81.3E; FEIR certified October 18, 1984) estimate that an additional 21.7 million gsf of space in all uses would be built and occupied in the C-3 district. Most of this additional space (16.8 million gsf, almost 80 percent of the total) would be office space. According to the Downtown Plan forecasts, the rate of new office construction in the C-3 district would average about 1.1 million gsf per year between 1984 and 2000.[1] Although this forecast is for the downtown core, it does indicate that downtown San Francisco is likely to continue to be the major office center in the Bay Area region.

"In terms of land use, the most important factor in the regional consideration of cumulative development in downtown San Francisco is region-wide office development. Other land uses throughout the region, such as retail and hotel, are less affected by development in San Francisco, while the office space market is more regional in nature.

"Space in office buildings in the other eight counties of the nine-county Bay Area is estimated to be 27 million square feet as of the end of 1979.[2] While San Francico has the majority of existing office space in the region, the rapid growth of office functions in other Bay Area counties has resulted in less than one-half of the new space in office buildings in the region being built in San Francisco. Forty-five percent of the dollar value of building permits issued for office construction in the region between 1972 and 1979 was for San Francisco development.[3] Because the average cost per square foot for office construction is higher in San Francisco due to the predominance of high-rise office construction, the City's recent share, in terms of square footage of regional office space construction, may be inferred to be less than 45 percent.

"San Francisco's role as a headquarters city and major business center for the west coast stimulates office growth elsewhere in the Bay Area. As San Francisco firms expand, they look to suburban office markets to accommodate new functions and/or to attract a certain segment of the labor force. Moreover, as the costs of space in San Francisco have increased due to high levels of demand, cost-sensitive firms have chosen locations in other cities or in expanding surburban locations."

The following footnotes are added before footnote 1 on page 27 of the DEIR:

"[1] San Francico Department of City Planning, Downtown Plan EIR, EE81.3, certified October 18, 1984, pages 34 and 35. This estimate accounts for new construction, as well as demolition and conversion of existing space.

"[2] Association of Bay Area Governments (ABAG), "Bay Area Office Growth," Berkeley, California, April 1981, pages 31-62. This number may be an underestimate because the sources for the report apparently do not always include small office buildings.

"[3] Ibid., page 18."

Footnotes 1 through 3, referenced on pages 25 and 27, are changed to 4, 5 and 6.

B. EMPLOYMENT AND HOUSING

The following material replaces the first two sentences of the third paragraph on page 35 of the DEIR:

"About 19.0 million square feet of office space is currently proposed or under construction but not occupied in San Francisco. Of this space, 8.7 million is under formal review, 4.8 has been approved and an additional 5.5 million is either under construction or newly constructed. Table F-2 in Appendix F, pages A-66 to A-69 [pages A-56 to A-59 of this supplement] shows the specific projects which are included in these numbers."

The following material replaces the Housing setting discussion on pages 35-37 of the DEIR:

"2. Residence Pattern and Housing

"From the cumulative perspective of both the amount of future development and the regional context for the impacts of this development, two aspects of the analysis of housing-related impacts are important: residence patterns and housing market implications. Residence patterns describe the distribution of workers by place of residence for San Francisco and the rest of the Bay Area. Analysis of these patterns is useful in assessing the degree to which San Francisco residents benefit from job growth, in estimating travel demand, and in considering the relationship between job growth and labor force and housing throughout the region, as well as in considering the housing market effects of development. The discussion of housing market implications focuses on the link between employment growth and the availability and price of housing, how changes in the housing market could affect various groups of consumers and how residents' circumstances could change as a consequence of these effects.

"As background for the subsequent cumulative impact discussion (Section IV.E.2, pages 66-70), this section presents current residence patterns for downtown workers; discusses trends in labor force, employment and population for the City and the region; and describes current housing market conditions in San Francisco and the region.

"The information presented in this subsection is based on the survey and analysis of C-3 district employment and residence patterns prepared for the Downtown Plan EIR. This information does not account for all workers in the greater downtown area (i.e., the project site is located in a C-2 district six blocks north of the northermost C-3 district boundary). It does, however, describe the majority of the workforce in the downtown area and it may be assumed that employee characteristics in the non-C-3 district areas adjacent to downtown, including residence patterns, would be similar to those found in the C-3 district.

"a. Residence Patterns for San Francisco and the Region[4]

"In 1984, it is estimated that 159,000 C-3 district (downtown core) workers live in San Francisco. This group represents about 45% of all employed residents of San Francisco. An additional 41% of the City's employed residents work elsewhere in the City including Civic Center, south of Folsom and the project vicinity near the base of Telegraph Hill. Most C-3 district workers (55.5%) are estimated to live in San Francisco in 1984. The next largest group (73,000 or 26%), live in the East Bay. About 35,000 (11.5%) live on the Peninsula and about 19,000 (7%) in the North Bay. While, as mentioned above, these workers represent a relatively large share of the employee population in San Francisco (45%), they represent relatively smaller shares of the employed population in each of the other areas (less than 10% in each).

"These current conditions are not static and, in fact, have been changing over time. Trends indicate that the number of San Francisco workers who live in the City is increasing.[5] The percentage of total City employment they represent is declining. Changes in population, housing, labor force and employment in San Francisco and the rest of the region provide background for these trends.[6]

"Changes in demographic composition of the City's population have resulted in employment growth (an increase of 24,200 from 1970 to 1980) despite an overall decline in total population (a decrease of 36,700 from 1970 to 1980). The growth in number of employed persons largely reflects higher labor force participation than in the past, as the number of people in their working years (ages 16-64) has been relatively constant.

"The number of households and housing units in the City has continued to increase, although by a relatively small amount. Given the population decline, the average number of persons per household has also decreased. Because of the changing composition of the population, however, the number of adults and of employed adults per household has increased.

"Demographic trends related to the population and labor force characteristics of the region, outside San Francisco, show similarities to the trends for the City described above. From 1970 to 1980, employment growth exceeded population growth. Employed residents in the rest of the region increased by 670,000 (nearly 45% growth) over the past ten years, while population increased by 588,000 persons (about 15% growth). This reflects both the passing of the "baby boom" generation into the labor force and the increasing participation of women in the labor force. The growth in number of employed residents exceeded the increase in households and of housing units, so the average number of workers per household increased. The main difference between San Francisco and the rest of the region is the magnitude of the changes, as the amount of growth in population and employed persons was much larger in the rest of the region than in San Francisco.

"In the midst of these changes in population and labor force, business activity and employment have continued to grow in San Francisco. Jobs have grown at a faster rate and by a larger amount than the number of employed residents in the City. Thus, although the number of San Francisco jobs held by City residents has increased, the percent of overall San Francisco jobs held by residents has declined. There has been an increase in the percentage of San Francisco jobs held by persons living elsewhere in the region. This indicates the increasing relative importance of housing and labor force outside of San Francisco to jobs in the City.

"When considered from the perspective of City residents, the number of employed City residents working in San Francisco increased from 1970 to 1980. Although the percentage of residents working in San Francisco remains high (86% in 1980) this percentage has been declining. Reasons for this trend include the large growth of jobs in other counties of the region and the relocation of some San Francisco jobs to other counties. (San Francisco's share of total regional employment has declined, even though the City's employment has increased substantially.) Another factor is the increase in households with more than one worker, which increases the likelihood that some workers will commute to jobs outside the City.

"The trends described above incorporate a combination of many individual changes in employment and place of residence. Changes in the place of residence of San Francisco or downtown workers occur as individuals are newly employed in San Francisco or in the downtown who had not previously worked there, and as both existing and newly-employed workers move within the region.

"The changes that result in individuals being newly employed in the City (who had not previously worked there) can affect overall residence patterns if those newly employed have household and housing characteristics different from those they replaced or from all other workers in the City. They are likely to have different characteristics if the mix of types of jobs is changing (such as more office jobs relative to other types of employment), if the demographic characteristics of the work force in general are changing (such as changes in age distribution or ethnic/racial characteristics), or if there are changes in the distribution of the labor force within the region (such as more growth in number of labor force members in the areas surrounding San Francisco than in the City itself, or substantially larger growth in San Francisco employment than in employed City residents).

"Changes in residence patterns also reflect housing market factors. These factors have been particularly important in the recent past as housing choices (housing types, prices, rents, locations) have changed dramatically over the past five to ten years. Housing is now more costly, relative to incomes and to other goods and services than in the past. Further, a greater share of the region's housing is now located outside San Francisco and City housing has become more costly relative to housing in many other parts of the region than it once was. While housing choices change over time, their effect on residence patterns primarily occurs when a household enters the market to purchase or rent housing. Thus, as workers change their place of residence, a greater share is likely to live outside San Francisco, and those who choose to reside in the City may have different characteristics from the average of all other employees who secured housing in San Francisco under a different market situation.

"b. Housing Market Conditions in San Francisco and the Bay Area Region

"Housing Market Context

"Since the early 1970s, housing prices and rents have increased dramatically in San Francisco and throughout the Bay Area. Demand for housing has been strong and supply has not kept pace with demand in many areas. In addition, in the early 1980s there were major changes in financial markets that substantially increased the cost of money for housing. Many different factors contribute to the current housing market situation. These include changing lifestyles, changing demographic and household characteristics, changing household incomes, employment growth, attractiveness of the Bay Area as a place to live, availability and cost of financing, attractiveness of real estate as an investment, no-growth policies in some communities and the increasing scarcity of land in other communities.

"As a result of all these factors, many households now allocate a greater share of their financial resources to housing, and the housing choices available at various prices and rents have changed. Many people cannot now afford the housing they prefer and many are not housed at the standard that, until recently, they had come to expect.

"Changing Conditions in San Francisco's Housing Market

"Over the decade from 1970 to 1980, net additions to the City's housing stock included 6,200 units, an increase of 2%. About 1,900 units were added from 1980 through 1982. Most of the units added were for-sale housing. Overall, about one-third of the City's stock continues to be owner-occupied and about two-thirds renter-occupied. Among Bay Area counties, San Francisco has the largest percentage of units that are renter-occupied.[7]

"This net addition represents low growth of the housing stock relative to the strength of demand over this period. The low vacancy rate in San Francisco highlights the severity of the housing market pressures in San Francisco. Data from the Federal Home Loan Bank show a vacancy rate of 0.8% for San Francisco. San Francisco had the lowest housing vacancy among the nine counties of the Bay region in 1980.[8]

"These market pressures are part of the explanation for the substantial increase in housing prices in the City. Market trend data based on appraisals indicate that housing value increases averaged 8.5% per year in the early 1970s and over 23% per year from 1975 to 1980. From 1980 to 1983, appreciation slowed to an annual average of about 6%. San Francisco housing prices remain above those for housing in many other parts of the region. The market trend data indicate that the rates of increase in San Francisco have exceeded those in most other areas.[9]

"Rents in San Francisco have also increased. Census data indicate that median contract rent more than doubled from 1970 to 1980, for an average annual growth of 7.6%. Rents in San Francisco generally cover a wider range than rents in other parts of the region, including some of the lowest rental housing and some of the most expensive rental units in the region.[10]

"Despite rising housing prices and rents, the private market continues to be unable to produce enough new housing to relieve competitive pressures. Because of the high costs of land, financing and construction, the private market cannot produce housing that is affordable to many households. There is particular difficulty in producing rental housing, since residential rents, unlike for-sale housing prices, have not kept pace with rising construction and land costs, or with inflation.

"Incomes of City residents have not kept pace with increases in the costs of housing. During the 1970s, on average, income increased by about 135% over the period while housing costs overall (combining median prices and rent) went up about 165%.[10] Thus, the percentage of income allocated to housing increased.

"The percentage of income spent on housing is higher for lower income households; this percentage declines as income increases. Across income categories, the percentage of income spent on housing is higher for renters than for owners. For example, census data show that of the 31% of households with incomes under $10,000 in 1979, on average, the renters spent 48.6% of their income for housing and owners spent 26% for housing. Of the 39% with 1979 incomes of $20,000 or higher, the renters spent 15.7% of their income on housing while the owners spent 11.2%.[10]

"In the current housing market, there continue to be incentives to upgrade existing housing. Consumers priced out of higher priced neighborhoods are often attracted to other areas where housing can be secured initially at lower costs and investments made to upgrade the units. As this occurs, desirability of the area improves, prices and rents rise and there are changes in the types and incomes of households in the neighborhood. Moreover, the amount of housing stock available at lower prices and rents is reduced. This phenomenon (often called "gentrification") has occurred in areas of San Francisco, primarily in neighborhoods with housing priced at or below average levels, but not the lowest priced housing in the City. In recent years, increasing preferences for central city neighborhoods and older housing and an increase in the types of households with these preferences have combined with overall competitive market conditions to support upgrading of this type.

"Regional Perspective on Housing Market Conditions

"Most of the housing market conditions described above for San Francisco are applicable throughout the Bay Area. Increases in home prices and interest rates during the past decade have raised the cost of owning housing. As a result, many first time homebuyers and new entrants into the region's housing market have difficulty affording Bay Area housing. In the rental housing market, a large number of households face this problem. The lack of new construction and continued strong demand support upward pressure on rents. Among renters, many lower-income households are faced with increasing difficulty securing affordable housing.

"Although these conditions exist to some extent in other parts of the country, the Bay Area remains one of the most desirable places to live and has one of the most competitive housing markets in the nation. Because of the limited land area of San Francisco, the role of the City as employment center for the region, and the demographic characteristics of the City's population, the region's market conditions (in terms of supply, demand and price) are at their extreme in San Francisco.

"Between 1970 and 1980, 436,200 housing units were added in the Bay Area. Most of the additions were in the East Bay and the Peninsula, each with about 40% of the total increase. The largest percentage increase in housing over the period occurred in the North Bay counties.[10]

"The shortage of supply relative to demand is evidenced in the vacancy rates for Bay Area counties. In 1982, the vacancy rate in each Bay Area county was below 2%. With the exception of Solano County (where the 1980 vacancy rate was 3%), this situation has persisted since 1980.[11]

"Market trend data on the value of single-family residences in the Bay Area reflect the strong demand for housing in the region. Over the region as a whole, housing values increased almost four-fold between 1973 and 1983; the annual rate of increase in value was about 14% per year, compounded. The pattern is similar among East Bay, Peninsula and North Bay housing sub-markets. In San Francisco, the data indicate somewhat stronger demand and more market pressure on existing units than the average for the region.[12]"

The following footnotes replace footnotes 4-12 on pages 37-38 of the DEIR. Footnotes 1-3 and 14-16 are unchanged and thus not revised, however, footnotes 14-16 are renumbered for consistency as footnotes 13-15 on page 38.

"[4] The data and information in this sub-section are based on a survey and analyses of C-3 District employment and residence patterns prepared for the Downtown Plan EIR (EE81.3). This information, therefore, does not account for all workers in the greater downtown area; it does, however, describe the majority of the workforce in that area. The residence patterns for C-3 district workers in 1984 are presented in the Downtown Plan EIR on pages IV.D.36-39 and, in the context of future residence patterns, in Table IV.D.15 on page IV.D.64. The survey results related to the residence patterns of C-3 district workers are presented in the setting section on Residence Patterns and Housing (Section IV.D.) in the Downtown Plan EIR, which is available for review at the Department of City Planning.

"[5] The trends summarized here are discussed in more detail with relevant tables in the Downtown Plan EIR, pages IV.D.42-53, which are hereby incorporated by reference pursuant to State CEQA Guidelines, Section 15150.

"[6] Population and employment data from the U.S. Census, 1960, 1970 and 1980 for San Francisco and the region are the basis for the following text discussion. See Downtown Plan EIR (EE81.3, certified October 18, 1984), Table IV.D.14, page IV.D.48, and related discussion on page IV.D.48.

"[7] U.S. Department of Commerce, 1970 Census of Population and Housing, and 1980 Census of Housing and San Francisco Department of City Planning, Residence Element of the Comprehensive Plan, June 1984.

"[8] Real Estate Research Council, Year-End 1982 Report - August 1983, Volume 34/Numbers 2 and 4.

"[9] Real Estate Research Council, Market Trend Report - April 1983, Volume 35/Number 1.

"[10] U.S. Department of Commerce. 1970 Census of Population and Housing, and 1980 Census of Housing.

"[11] Real Estate Research Council, Year-End 1982 Report - August 1983, Volume 34/Numbers 2 and 4.

"[12] Real Estate Research Council, Market Trend Report - April 1983, Volume 35/Number 1."

C. AIR QUALITY

The following text replaces the first two paragraphs on page 42 of the DEIR:

"The Bay Area Air Quality Management District (BAAQMD) operates a regional monitoring network which measures the ambient concentrations of six air pollutants: ozone (O_3), carbon monoxide (CO), total suspended particulates (TSP), lead (Pb), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). On the basis of the monitoring data, the Bay Area, including San Francisco, currently is designated a non-attainment area with respect to the federal ozone and CO standards. A three-year summary of the data collected at the BAAQMD monitoring station nearest the project site (about two miles south-southeast of the site at 900 23rd St.) is shown in Appendix H, page A-76, together with the corresponding federal and/or state ambient air quality standards [page A-66 of this supplement]. In 1983, the State one-hour average ozone standard was exceeded one time and the State 24-hour average TSP standard was exceeded four times. In 1982, the eight-hour standard for CO was exceeded once and the 24-hour TSP standard exceeded three times. The one-hour CO standard was never exceeded. (A more stringent one-hour CO standard went into effect January 15, 1983.) The only air pollutant to exceed standards in 1980 and 1981 was TSP; the 24-hour standard was exceeded six times in 1980 and once in 1981.

"A CO "hotspot" monitoring program was conducted at 100 Harrison Street during the winter of 1980-81, approximately one mile southeast of the proposed project. The observed high eight-hour average concentration of 7.8 parts per million (ppm) does not exceed the 9 ppm state standard.[1] The high one-hour average concentration of 13 ppm does not exceed the 20 ppm state standard or the 35 ppm federal standard. In 1982, a street-level average CO maximum of 14.5 ppm was measured at the street-level monitoring station at 939 Ellis Street near Van Ness Avenue about one and one-half miles southwest of the proposed project. This data indicates that some locations in San Francisco, particularly those near very high traffic volumes and very congested traffic flow, may experience violations of the eight-hour CO standard during adverse meteorological conditions.

"Comparisons of these data with those from other BAAQMD monitoring stations indicate that San Francisco's air quality is among the least degraded of all the developed portions of the Bay Area. Two of the three prevailing winds, westerly and northwesterly, blowing off the Pacific Ocean reduce the potential for San Francisco to receive pollutants from elsewhere in the region.

"San Francisco's air quality problems (primarily CO and TSP) are due largely to pollutant emissions from within the City. CO is a non-reactive pollutant with one major source category, motor vehicles. Ambient CO concentrations generally follow the spatial and temporal distributions of vehicular traffic. TSP levels are relatively low near the coast, increase with distance inland, and peak in dry, sheltered valleys. The primary sources of TSP in San Francisco are demolition and construction activities, and motor vehicle travel over paved roads.

"San Francisco contributes to air quality problems (primarily ozone which is a regional problem) in other parts of the Bay Area. Ozone is not emitted directly, but is produced in the atmosphere over time and distance through a complex series of photochemical reactions involving emitted hydrocarbons (HC) and nitrogen oxides (NO_x) which are carried downwind as the photochemical reaction occurs. Ozone standards are exceeded most often in the Santa Clara, Livermore, and Diablo Valleys, because local topography and meteorological conditions favor the buildup of ozone and its precursors there.

"In 1979, emissions from motor vehicles were the source of 94% of the CO, 36% of the hydrocarbons (HC), 7% of the TSP, and 44% of the nitrogen oxides (NO_x) in San Francisco, while power plant fuel combustion was the largest single source of sulfur oxides, about 33% of the total. These percentages are expected to apply reasonably well to current conditions.[2]

"In response to the Bay Area's ozone and CO nonattainment designations, ABAG, BAAQMD, and the Metropolitan Transportation Commission (MTC) prepared and adopted the 1982 Bay Area Air Quality Plan,[3] which establishes pollution control strategies to attain the federal ozone and CO standards by 1987 as required by federal law. These strategies were developed on the basis of detailed subregional emission inventories and projections, and mathematical models of pollutant behavior, and consist of stationary and mobile source emission controls and transportation improvements. The BAAQMD, MTC, and California Bureau of Automotive Repair have primary responsibility for implementation of these strategies."

The following replace footnotes 1-4 on page 43 of the DEIR:

"[1] Association of Bay Area Governments, AQMP Tech Memo 40, "Results of the 1980/1981 Hotspot Monitoring Program for Carbon Monoxide," Berkeley, California, January 1982.

"[2] Bay Area Air Quality Management District, Base Year 1979 Emissions Inventory, Summary Report (Revised), San Francisco, California, July 1, 1982.

"[3] Association of Bay Area Governments (ABAG), BAAQMD and MTC, 1982 Bay Area Air Quality Plan, Berkeley, California, December 1982."

IV. REVISED CUMULATIVE IMPACT ANALYSIS

A. INTRODUCTION TO CUMULATIVE IMPACTS ANALYSIS

The following replaces the title "A. ISSUES NOT ADDRESSED" on page 46 of the DEIR:

"A. INTRODUCTION
"1. Issues Not Addressed"

The remaining text under "A. ISSUES NOT ADDRESSED" remains unchanged.

The cumulative analyses included in the DEIR used the list-based approach, employing the June 1, 1983 list of projects in the greater downtown area. Since that time, the list has been updated through March 10, 1984 and that updated list has been employed in the cumulative analyses included in this Supplement to the Draft EIR. The process used to develop the List of Cumulative Office Development in Downtown San Francisco appears in Appendix F, revised pages A-61 to A-70A of the DEIR [pages A-51 to A-61 of this document]. Additionally, since the publication of the DEIR a new employment forecast approach has been developed for the Downtown Plan EIR (81.3E, FEIR certified October 18, 1984) and also has been used in this supplement for incorporation into the EIR.

The following text is added following the third paragraph on page 46 of the DEIR:
"2. Cumulative Impact Analysis

"Two approaches are used to assess cumulative impacts. The list-based approach uses the March 10, 1984 list of projects in the greater downtown area (including the project site) that are under construction, approved or under formal review by the Department of City Planning, as the basis for estimating future activity. The process used to develop the List of Cumulative Office Development in Downtown San Francisco appears in Appendix F, pages A-61 to A-70A [pages A-51 to A-61 of this supplement]. The space in projects on the list represents forseeable future development that is added to the base year (1984) conditions. The Downtown Plan EIR forecast approach presents cumulative scenarios for C-3 district land use change, employment growth and residence patterns between 1984 and 2000 for the Downtown Plan and Five Alternatives. Integrated into the forecasts are analyses of policies affecting the size, cost and location of new development, in the context of underlying local and regional economic conditions influencing the demand for space.

"Because the project site is within a C-2 district, most estimates of cumulative effects derived from the Downtown Plan forecast are not directly comparable. For purposes of transportation impacts, however, it is assumed that the C-3 (downtown core) zoning district would represent the average condition in terms of downtown employee travel characteristics and that these characteristics would be similar for outlying downtown areas. Further, the cumulative analysis in the Downtown Plan EIR presumes non-C-3 district demand of the type proposed by this project and includes such demand in cumulative demand. (The project site is located six blocks north of the northernmost C-3 district boundary.) Appendix E, pages A-52 to A-54 [pages A-48 to A-50 of this supplement] highlights the essential differences between the list-based approach and the Downtown Plan approach.

"Data based on surveys and findings of the Downtown Plan EIR is presented, for comparison of downtown office growth projections and regional housing impacts. The Downtown Plan forecast approach included non-C-3 district growth in its estimation of regional employment and housing growth, although it did not explicitly report growth in various sectors outside of the C-3 district. The residence patterns associated with projects outside but adjacent to the C-3 district are assumed to be similar to those reported for projects within the C-3 district. However, the project itself cannot be added to the C-3 district growth to estimate its proportional contribution to cumulative impacts on housing supply in San Francisco and the region. Because of the above differences, these estimates of cumulative effects derived for each approach cannot be directly compared."

B. HISTORIC AND CULTURAL RESOURCES

The last two paragraphs on pages 64 and 65 of the DEIR are revised as follows:

"Due to the presence of known and likely sites in the project vicinity, archaeological testing was done to determine whether potentially significant artifacts might exist on the project site, and a report was made (July 8, 1982) summarizing the findings of that testing.[4] Evidence from the test borings indicated the possible presence of a buried Gold Rush hulk, such as the Philip Hone, at the site but the evidence was inconclusive and several alternative explanations possible.

"A subsequent archaeological testing program was undertaken to augment the earlier testing and was presented in a report dated October 25, 1984. (See Appendix B, Archaeological Report, page A-21 [page A-1 of this supplement]). The report concludes that, 'taken together, the results of the 1982 and 1984 archaeological testing programs at Embarcadero Terraces point toward the conclusion that a buried ship hulk does not exist within the confines of the subject parcel. Similarly, no other archaeological resources of demonstrable significance have been detected or identified in the project area.' No additional preconstruction testing procedures were recommended. However, the report also concludes that, 'although the 1982 and 1984 archaeological testing programs at Embarcadero Terraces have allowed the author to develop a relatively detailed portrayal of the history of the project site, . . . subsurface evaluation has . . . sampled a small percentage of the total area within the subject parcel. It is easily conceivable that potentially significant cultural resources exist undetected at some location on the property.' Measures were recommended in the event that any archaeological resources might be unearthed during construction of the project. See page 120 for a mitigation measure to address these concerns."

The following footnote is added after footnote 3 on page 65:

"[4] Alan G. Pastron, Ph.D., President, Archeo-Tec (Consulting Archaeologist), Archaeological Report for Embarcadero Terraces Development, July 8, 1982. (See Appendix B, page A-21)."

The 1984 archaeological report replaces the 1982 report in Appendix B as revised, pages A-21 to A-45L.

C. RESIDENCE PATTERNS AND HOUSING

The following text replaces paragraphs two through eight of 2. Housing and all of 3. Cumulative Effects, pages 66 through 70 of the DEIR:

"Employment growth and building development in San Francisco will result in more employees working and living in the City. Over time, more existing residents will take San Francisco jobs and others who take San Francisco jobs will move into the City. Office workers employed by the project would contribute to the cumulative impact upon the City and regional housing demand.

"Recently-published Draft EIRs for downtown office projects use two approaches to cumulative analysis of downtown office development: the Downtown Plan approach of forecasting space and employment and the approach of using a list of proposed projects. (A detailed comparison of the two approaches is presented in Appendix E, page A-52 [page A-48 of this Supplement]). The Downtown Plan approach is currently limited to the C-3 district (downtown core) while the list covers a larger geographic area, including the nearby C-2 district, the location of the project site. In addition, there is no definite time frame associated with the list, while the Downtown Plan forecast represents a best estimate of the development likely to be built and occupied from 1984 to 2000. It is because of these and other differences that the cumulative estimates of future residence patterns under each approach are not comparable. Although the project can be compared to the cumulative totals of the list approach, the project cannot be directly compared with the Downtown Plan approach regarding housing because the project lies outside the C-3 district. While the proposed project has been taken into consideration in the projection of total regional employment growth and residence patterns, it has not been identified as a separate component of that growth as has the employment growth projected for the C-3 district. As such, with the information provided in the Downtown Plan EIR methodology, it is not possible to project the project's proportion of cumulative impact on regional housing supply and demand. However, surveys of recently completed and occupied projects in areas adjacent to the C-3 district suggest that employee residence patterns are similar to those projected for the C-3 district.[5]

"a. Future Downtown Employment

"Analyses of the cumulative effects of office projects in the greater downtown area, including the proposed project, use the list of all projects that are under construction, approved or under formal review. (This list is discussed in Appendix F of this report. The list includes projects throughout a greater downtown study area, which includes the C-3 as well as the nearby C-2 and M-1 districts.) It is possible to calculate, from the list, the change in the number of downtown workers living in San Francisco associated with this amount of development. Adding this number to the 1984 base estimate of downtown workers residing in San Francisco produces an estimate of total downtown workers living in the City, at the time all projects on the list have been built and occupied. The results from this approach indicate that about 230,000 workers in the greater downtown area would live in San Francisco at that time.[6]

"The list approach uses data from the September 1983, Transportation Guidelines to estimate the residence patterns of future employees in the buildings on the list. Unlike the Downtown Plan forecast approach, this approach incorporates no changes over time in either employment densities or residence patterns. It assumes that current average conditions (reflected in the Transportation Guidelines) would continue throughout the build-out period for the list.

"The project would account for about 0.1 percent of all downtown workers living in San Francisco at the time when all projects on the list would be built and occupied. The project would represent a smaller share of future activity in the greater downtown area than of activity in the C-2 district alone.

"An alternative means of evaluating the cumulative effects of downtown core office projects is to use forecasts of residence patterns in the year 2000 prepared for the Downtown Plan EIR.[7] These forecasts incorporate future housing, labor force and employment patterns in San Francisco and throughout the region and consider changing demographic, housing market and transportation factors.

"According to the Downtown Plan forecasts, approximately 189,000 C-3 district workers would be living in San Francisco in 2000. This represents an increase of 30,000 residents employed in the C-3 district over the 159,000 estimated for 1984, a 19% increase.[8] Relatively more employed San Franciscans would be employed in the C-3 district. The percentage (employed San Franciscans holding C-3 district jobs) would increase from 45.0 percent in 1984 to 47.5 percent in 2000. Relatively fewer C-3 district jobs would be held by San Franciscans. The percentage (C-3 district jobs held by San Franciscans) would decline from 55.5 percent in 1984 to 50.2 percent in 2000. These changes would be the result of cumulative development and employment growth in the C-3 district between 1984 and 2000. It is important to understand the difference between the two percentages above. In each case, the same estimate of the number of jobs held by San Francisco residents is compared to an estimate for a larger group: to all employed residents of the City in the first instance and to all C-3 district employment in the second. The percentages are different since the number of employed residents is different from the number of jobs. These percentages both describe the same employment situation, but from different perspectives.

"The proposed project would be located outside the C-3 district and is thus not included as part of the employment base for the C-3 district residence patterns forecasts. Employment generated by the project would be in addition to the forecast increase in C-3 district employees by the year 2000. Assuming residence patterns similar to the nearby C-3 district, approximately 222 project employees would be San Francisco residents.

"b. Housing Market Implications for San Francisco[9]

"With continued employment growth, there would be more people with preferences for San Francisco housing and with greater financial resources to pay for housing. This additional demand for housing would be added to an otherwise large group of consumers with preferences for City housing.

"The supply of housing is expected to be expanded in San Francisco. However, the private market is currently unable to directly produce an adequate supply of affordable housing. This situation arises from a number of national, regional and local factors and is expected to continue.

"There would be greater competition for available housing units with employment growth than without it. As a result of increased competition, housing prices and rents would be higher with continued employment growth than without it. How much higher depends on the future of other factors (such as interest rates and the availability of financing) and cannot be easily quantified. Generally, continued employment growth at the levels reflected by the cumulative list and the Downtown Plan EIR forecast could contribute to a future situation where housing prices and rents were moderately higher, on average, than current levels. At a minimum, employment growth is likely to be among the factors that keep prices and rents at their current levels, in constant dollars.

"A more competitive City housing market with higher prices/rents would affect the type and quality of housing that can be purchased or rented for various prices and rents, the share of financial resources devoted to housing, and the extent to which housing needs and preferences are met. Over the long term, it could also affect the mix of types of residents in the City.

"Different households would be affected in different ways. There would be people who decide not to move into the City and existing residents who would eventually move out of the City for more acceptable housing elsewhere. There would be many individuals who continue to live in San Francisco and pay higher prices/rents for City housing. Still others, unable or unwilling to pay more, would accept housing that does not meet their preferences or needs. And finally, there would be owners of existing units who would benefit to the extent that their housing appreciated.

"Generally, those households with fewer financial resources available to pay for housing would make the most sacrifices in adapting to more competitive market conditions. They would have less ability to compete for housing and fewer options available to them. San Francisco currently has and will continue to attract a large number of persons that would be faced with these difficulties in obtaining housing.

"The proposed project, as part of the future pattern of downtown office development, would contribute to these housing market impacts. The project's individual contribution cannot be separately identified.

"c. Regional Perspective on Residence Patterns and Housing

"The residence patterns of San Francisco workers can also be considered from a regional perspective. In fact, future labor force, housing and employment throughout the region were important factors in the Downtown Plan residence patterns forecasts. Expected trends in labor force participation, workers per household, housing production and employment growth provided the future regional context in which the Downtown Plan forecasts were prepared.

"The residence patterns forecast using the list of downtown projects indicate that the largest number of downtown workers would live in San Francisco, followed by the East Bay, the Peninsula and the North Bay. Unlike the Downtown Plan forecasts, the residence patterns for downtown workers do not consider changes over time in regional labor force, housing and employment.[10]

"The Downtown Plan 1984 estimates and forecasts for 2000 lead to similar conclusions except that the largest increase of C-3 district workers would be for those living in the East Bay, followed by San Francisco, the Peninsula and the North Bay. The C-3 district workers estimated using this approach also would represent a large share of both the totals and the growth of employed residents in San Francisco and relatively smaller shares of both the totals and growth of employed residents elsewhere in the region. Comparing 1984 and 2000, there would not be major changes in the C-3 district percentages of the labor force in each area.

"In terms of the region's housing market, downtown development and that adjacent to the downtown, and employment growth would not, by themselves, have a major effect on the housing markets in other Bay Area counties or in the region overall. As a part of total regional employment growth to the year 2000, however, increases in San Francisco employment can be viewed as contributing to regional housing demand. A strong regional economy has been and will continue to be a factor supporting a competitive regional housing market with relatively high housing prices and rents."

"The Downtown Plan forecast approach included non C-3 district growth in its estimation of regional employment and housing growth. As the proposed project would be located outside but near the C-3 district and would be a land use type similar to that projected for future growth in the C-3 district, residence patterns associated with the project may be assumed to be similar to those reported for projects within the C-3 district for the year 2000. Based on this assumption, of the total of 570 employees generated by the project, 250 (43.9%) would live in San Francisco, 201 (35.3%) would live in the East Bay, 64 (11.3%) would live on the Peninsula and 54 (9.4%) would live in the North Bay.[11]"

The following footnotes replace footnotes 5, 6 and 7 pages 76 and 77 of the DEIR:

"[5] Linda Hausrath, Principal, Recht Hausrath Associates, Inc., telephone conversation, December 4, 1984.

"[6] For the 1984 estimates of workers in the greater downtown area, the C-3 district estimates of employment and residence patterns prepared for the Downtown Plan ~~D~~EIR were used as a base to which order-of-magnitude estimates for that year for the other downtown areas were added. The Transportation Guidelines September 1983 were used to estimate employment and residence patterns for projects on the March 10, 1984 list for the greater downtown area. The workers associated with these new projects were then added to the 1984 base year total estimate.

"[7] For a description of the methodology used to forecast residence patterns, see Appendix I, Downtown Plan EIR, pages I.8-I.30. For a description of existing and forecast future residence patterns of C-3 district workers, see Downtown Plan EIR, Section IV.D., Residence Patterns and Housing.

"[8] Downtown Plan EIR, page IV.D.67.

In order to ensure consistency with the cumulative transportation analysis and to provide information on region-wide impacts, this section does not use the OHPP and 101 Montgomery formulas for estimating the number of workers who would live in San Francisco. These formulas only provide estimates of office workers living in San Francisco; they do not include factors for estimating workers living in other parts of the region. These formulas were applied to the project in the original DEIR, page 76.

"[9] This subsection presents a summary of the discussion in the Downtown Plan EIR (see pages IV.D.77-IV.D.82 and pages I.1-I.8), which is hereby incorporated by reference pursuant to State CEQA Guidelines, Section 15150.

"[10] The distribution of downtown workers among the Bay Area counties is based on the residence patterns forecasts for 1984 prepared for the Downtown Plan EIR and on the Department of City Planning's Transportation Guidelines for Environmental Impact Review, September 1983.

"[11] Linda Hausrath, Principal, Recht Hausrath and Associates, Inc., telephone conversation, January 16, 1985; and Downtown Plan EIR, Volume II, Table I.10, page I.38. Although the data included in this table was generated for the C-3 district, the proximity of the project site to the C-3 district and the similarity of the land uses on site to those projected for the C-3 make the C-3 district information applicable to the proposed project."

Footnotes 8 through 15, referred to on pages 72 through 76 of the DEIR, and found on page 77 of the DEIR are renumbered as footnotes 13 through 20.

D. TRANSPORTATION

Figure 19, page 86 of the Transportation Impacts section of the DEIR is moved to revised page 40A following page 40 of the Transportation Setting Section of the DEIR, and becomes Figure 16. Figures 16, 17, 18, pages 61 through 63 of the DEIR are renumbered to become Figures 17, 18 and 19.

The following material replaces F. TRANSPORTATION, CIRCULATION AND PARKING, pages 78 through 98 of the DEIR. Figures 20 (regarding parking facilities) and 21 (regarding pedestrian flows), pages 93 and 96 of the DEIR, have been reversed in order due to changes in the organization of the Transportation Impacts section and existing Figure 20 in the DEIR has been revised to reflect an updated parking survey. Both figures have been included here in their appropriate places, as revised.

"1. Travel Demand Analysis

"a. Project Travel Demand

"Based on City guidelines and Caltrans trip generation research, the project travel has been calculated in Table 7, page 79 [page 37 of this supplement].[1,2] The project would generate a net increase of about 2,966 person trips daily: about 309 during the p.m. peak hour and 507 during the peak two-hour period. A total of 274 outbound trips would occur during the peak hour and 443 trips during the peak two-hour period. The geographical and modal distribution of project travel in Table 8, page 80 [page 38 of this supplement] has been based upon projected modal splits for the year 2000 contained in the EIR for the Downtown Plan (EE81.3).[3]

"Modal assignments have been made on the basis of future modal splits for the year 2000 contained in the EIR for The Downtown Plan (EE81.3). The future modal splits have been applied to the project travel for the purpose of comparing project travel with future travel demand on the transportation system serving San Francisco. The modal splits used were derived from aggregate data for the C-3 District, and thus represent an average condition. The actual modal split for travel from the project may vary from the C-3 District average. However, because the travel demand forecasts used to derive the average modal split data include the travel from the project, application of the average

TABLE 7

PROJECT PERSON TRIP GENERATION[1,2,3]

Land Use	Daily Trip Rate	Daily Trips	Trips (1 hr/2hr) Total	Trips (1 hr/2hr) Outbound
3,000 gross sq.ft. retail area	150/1,000[1,2]	450	45/90	23/47
139,000 gross sq. ft. office area	18.1/1,000[3]	2,516	264/417	251/396
	NET TOTALS	2,966	309/507	274/443

450 daily retail trips	=	18 work trips[4]	+	432 non-work trips
2,516 daily office trips	=	1,006 work trips[4]	+	1,510 non-work trips
TOTALS		1,024 work trips		1,942 non-work trips

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[1] Institute of Transportation Engineers, Trip Generation, 1979, not paginated.

[2] Caltrans, Eleventh Progress Report on Trip Ends Generation, July 1976, pages 167, 168, 171 and 174.

[3] San Francisco Department of City Planning, Guidelines for Environmental Review: Transportation Impacts, September 1983.

[4] Based upon one retail employee per 350 gross square feet and one office employee per 275 gross square feet as outlined in the Guidelines for Environmental Review: Transportation Impacts, September 1983.

TABLE 8

DISTRIBUTION OF NEW PROJECT PERSON TRIPS OUTBOUND DURING PM PEAK PERIOD

	Peak-Period Person Trips (1-hr/2-hr)		
Location and Mode	Work	Non-Work	Total[1]
San Francisco			
Auto	37/59	1/2	38/61
Muni			
NE	6/14	2/4	8/18
NW	22/35	0/1	23/36
SW	20/38	1/1	20/39
SE	4/9	1/1	5/10
BART	6/12	0/1	7/12
Walk	10/20	26/48	36/68
Other	2/4	---	2/4
	108/192	31/57	139/248
East Bay			
Auto	20/23	1/1	21/24
BART	38/58	1/3	40/61
AC	13/22	---	13/22
Other	1/1	---	1/1
	72/104	2/4	74/108
Peninsula			
Auto	17/25	---	17/26
BART	7/9	---	8/9
Samtrans	4/8	---	4/8
SP	6/7	1/1	7/8
Other	1/3	---	1/3
	36/52	1/2	37/53
North Bay			
Auto	8/11	0/1	9/10
GGT Bus	12/18	---	12/18
GGT Ferry	2/2	---	2/2
Other	2/2	---	2/2
	24/32	1/1	25/33
	239/379	35/64	274/442

Source: Environmental Impact Planning Corporation; and Department of City Planning, Office of Environmental Review (OER), Final EIR for the Downtown Plan, EE81.3, Certified October 18, 1984, on file at OER, 450 McAllister Street, Fifth Floor, San Francisco, CA.

[1] Numbers may not total exactly due to rounding.

modal split data to project travel appears to be sufficiently accurate for purposes of comparison. Although Embarcadero Office Terraces is not within the Downtown Plan area, travel characteristics are basically the same. Based on the Levi's Plaza Final EIR and discussions with Levi's Plaza staff, office employment in the base of Telegraph Hill area tends to exhibit the same travel patterns as downtown.[4]

"Cumulative Travel Demand

"Analysis of the transportation impacts of cumulative development in San Francisco EIRs has been the subject of considerable public discussion. To date, cumulative analysis has been conducted on the basis of a list of proposed development in the greater downtown area (see Appendix F, page A-61 [page A-51 of this supplement], for the March 10, 1984 list of these projects). The Downtown Plan EIR method is a refinement of the transportation analysis process that uses projections of employment growth, independent of a list of proposed projects, to project future travel.[5]

The Downtown Plan EIR estimates cumulative transportation impacts of downtown growth. The transportation analysis provides a comprehensive, multi-model assessment of future development in the context of expected residential patterns, land use characteristics and employment forecasts. Additionally, the EIR methodology assumed increased future travel demand attributable to growth of non-C-3 travel based on historic trends. Projects within the C-3 District have been analyzed in the cumulative context of the Downtown Plan EIR. Projects within the Greater Downtown Area (Metropolitan Transportation District #1) including the project site, are within the envelope of projected non-C-3 travel demand.

"As discussed in Appendix J of the Downtown Plan EIR, transit service improvements have been assumed to be implemented by the year 2000. The service improvements assumed to occur correspond to the vehicle acquisition portions of the 5-Year Plans for Muni, AC Transit, SamTrans, CalTrain, and Golden Gate transit. In BART, both the vehicle acquisition program and the trackage improvements (Daly City tail track) were assumed to occur. These planned improvements would allow system capacities to keep pace with demand increases over time. The Downtown Plan EIR transportation analysis also assumes that regional auto use will continue to change over time in response to increasing levels of congestion on the bridges and freeways serving the City. The analysis projects a shift from single-occupant auto use (drive alone) for commuting to ridesharing (carpool, vanpool) and to transit use. The assumptions of continuing shift from auto to transit and ridesharing, most apparent in the 2000 modal splits, are made on the basis of long-term trends in transit use in the San Francisco commute corridors. Census data show that in the period 1970 to 1980, transit use for commuting increased. Similarly, Bay Bridge data show that ridesharing has been increasing over the last seven years. Thus, the shift to transit and ridesharing is well-established in San Francisco commute corridors.

"The travel data presented in the Downtown Plan EIR transportation sections (and in this report) are projections of total demand on the transportation system serving San Francisco. The projections comprise three components of travel demand. Two of the components were developed through an intricate travel modeling process for the C-3 District of San Francisco. These first two components of travel demand are C-3 District work (employee journey-to-work) travel and C-3 District non-work (all other) travel. The third component is non-C-3-District travel, which was forecast through an analysis of regional trends adjusted for the effect of development in the C-3 District. Non-C-3 travel is defined as travel that has neither an origin nor a destination in the C-3 District. Thus, non-C-3 travel includes travel to and from other parts of downtown and trips through San Francisco from other parts of the region. Employment projections are not specifically used in the non-C-3 travel analysis.

"Although the C-3 District transportation modelling process used analytical techniques common to travel forecasting, several portions of the process are unique to the C-3 District. The uniqueness is the result of the development of two major data bases --an inventory of existing land uses in the district and surveys of employees and employers in the district. The data developed from the surveys and the inventory have been used as the basis for forecasts of development and employment growth in the C-3 District. Sections IV.B., Land Use and Real Estate Development; IV.C., Business and Employment; IV.D., Residence Patterns and Housing; and Appendices G, Land Use and Real Estate Analysis; H, Business and Employment Analysis; and I, Theoretical Discussion of Housing Market Effects/Methodology for Forecasting Residence Patterns, of the Downtown Plan EIR, which contain detailed information about methods used to project future employment in the C-3 District, are incorporated by reference into this report and summarized by topic as relevant to this project below and in the EIR.

"The cumulative analyses for forecasting future land use, employment, and residence patterns are described in the Downtown Plan EIR. Appendix sections therein describe the methodology, identify the factors considered, and identify the types and sources of data used. A concise description of the major components of the process of developing employment and land use development forecasts is presented in the flow charts in Figure H.1 and Figure G.1. The factors considered in forecasting residence patterns are identified in the diagram in Figure I.1.

"The Downtown Plan EIR approach for forecasting future land use, employment, and residence patterns is based on a conceptual framework of the process of urban economic development. The analytical procedures incorporate a variety of types and sources of data and information concerning past, current, and likely future conditions regarding economic, real estate, demographic, and public-policy factors.

"The employment projections in the Downtown Plan EIR for the year 2000 exceed the employment projected using the current list-based cumulative analysis, as the list cannot take into account projects not yet proposed. The employment forecasts have been used as the basis for the travel demand modeling process. As described above, the C-3 District travel comprised two of the three components of total travel. Because of the use of the employment projections in the travel demand modeling process, the transportation forecasts for the year 2000 are independent of lists of cumulative development.

"Through a complex calibration and validation process of comparing projections of travel demand modeled on the basis of the survey of C-3 District employees to actual travel from measurements made by state, city and regional agencies, work and non-work travel demand from the C-3 District was modeled for the years 1984, 1990 and 2000. The modeling process comprises the following steps:

- Trip generation rates (empirical measures of total travel to and from a specific land use) were applied to employment forecasts by business activity (i.e., different rates were used for various land uses).

- The total travel from the C-3 District was distributed to seven Bay Area zones on the basis of projections of future employee residence patterns and origin-destination patterns for non-work travel.
- Trips to each of the seven regional zones were assigned to travel modes on the basis of modal splits (distribution of travel over the transportation modes, auto, transit, etc.) developed from the C-3 District surveys.

"At this stage of the process, the model forecasts total travel from the C-3 District. To complete the process and to allow analysis of the effect of travel demand from C-3 District development on the transportation network, the non-C-3 travel demand was analyzed. The total travel demand was calculated by summing C-3 District work and non-work travel and non-C-3 travel at sub-regional measuring points (called screenlines) located at or just beyond the San Francisco county line (except for Muni and BART Westbay service which were measured inside San Francisco, outside the downtown). The total travel demand was then compared to available service (capacity) at the screenlines and operating conditions (demand-to-capacity ratios) were analyzed assuming planned improvements. The results of those analyses are summarized later in this section.

"For future years, the C-3 travel modeling process was modified to incorporate changes in travel patterns (modal split changes, different travel times), employee residence patterns and changes in land use patterns. The process incorporates the dynamic aspects of changing Bay Area travel patterns, rather than assuming a fixed, unchanging condition over time. An example of past changes in travel patterns can be seen in the amount of carpooling activity on the Bay Bridge. In 1977, peak average vehicle occupancy westbound on the bridge was 1.7 persons per vehicle. By 1983, in response to increasing congestion and increased travel and parking costs, peak average vehicle occupancy westbound increased to 2.1 persons per vehicle.[6]

"The non-C-3 travel demand was forecast through the use of growth factors developed on the basis of historic trends in regional and sub-regional travel.[7] Historic growth rates (factors) have been used to project increases only for non-C-3 District travel at the regional screenlines. No other use of historic growth rates has been made in the transportation analysis. Because of the individual and unique nature of each of the transportation screenlines, each growth rate is based on data for that location. Thus, the growth rates for freeways project growth in auto trips, while the growth rates for transit project growth in ridership.

"Each of the historic growth rates inherently contains information about regional growth in travel patterns and thus incorporates not only growth from other parts of San Francisco, but from elsewhere in the region. As an example, the historic growth factor for trips southbound on US 101 includes travel that crosses the Bay Bridge or the Golden Gate Bridge as well as travel from San Francisco. However, the growth is projected as growth in auto travel and cannot be related directly to growth in employment in San Francisco.

"The other process used to forecast cumulative transportation impacts starts with a list of cumulative office and retail development (net new office and retail space) proposed, approved or under construction in the greater downtown area. From that list, through the use of static employment densities for office and retail uses and established trip generation rates, forecasts of travel demand are made. The forecast travel is assigned to modes on the basis of modal split factors which are assumed not to change over time. The Transportation Guidelines for Environmental Impact Review: Transportation Impacts (Department of City Planning, September 1983, hereinafter Transportation Guidelines) describe the process and the data used to calculate transportation impacts from the list-based development.

"The current list, shown in Appendix E, has about 19 million gross sq.ft of net new office space and about 0.9 million gross sq.ft. of net new retail space. On the basis of the Transportation Guidelines analysis, the list-based development would generate approximately 80,000 p.m. peak-period person trip-ends, of which about 49,000 would occur in the p.m. peak hour. Table 9, page 86 [page 44 of this supplement] shows a comparison of the projections of travel demand from the list-based analysis and from the Downtown Plan EIR for the year 2000. While the list contains development both inside and outside the C-3 District, the Downtown Plan EIR makes specific projections only for C-3 District development and the travel components shown in Table 9 are for the C-3 District only; therefore, for purposes of comparison, travel from the C-3 component of the list (about 13 million gsf of net new office space and 0.4 million gsf of retail space) has been analyzed for comparison with the projections from the Downtown Plan EIR for Alternatives 1 to 5 and the Downtown Plan.

COMPARISON OF LIST METHOD AND ECONOMIC FORECAST METHOD - OUTBOUND P.M. PEAK-HOUR CUMULATIVE TRAVEL DEMAND FOR THE C-3 DISTRICT (PERSON TRIP-ENDS)

	March 10, 1984 Cum. Dev. List[1]	Downtown Plan (1984-2000)[2]	Alternative 1 (1984-2000)[2]	Alternative 2 (1984-2000)[2]	Alternative 3 (1984-2000)[2]	Alternative 4 (1984-2000)[2]	Alternative 5 (1984-2000)[2]
Work Person Trips-ends	22,100	41,400	47,600	46,200	44,400	39,100	39,700
Other Person Trips-ends	8,200	12,100	14,700	14,200	13,400	11,800	11,800
Total Person Trips-ends	30,300	53,500	62,500	60,500	57,900	51,000	51,600
Muni							
Northeast	900	1,600	1,700	1,600	1,600	1,700	1,700
Northwest	3,700	1,800	2,000	1,900	1,800	1,800	1,800
Southwest	3,100	1,100	1,100	1,000	900	800	800
Southeast	600	1,100	1,000	1,000	1,000	600	700
BART							
Transbay	4,500	11,800	13,300	13,100	12,700	11,300	11,300
Westbay	1,900	2,400	2,800	2,700	2,600	2,300	2,300
AC Transit	1,700	200	600	500	300	-100	-100
GGT							
Bus	1,100	3,200	3,700	3,600	3,500	2,700	3,100
Ferry	300	800	800	800	800	800	800
SamTrans	300	1,200	1,300	1,300	1,200	1,000	1,100
SPRR/CalTrain	500	1,800	2,000	1,900	1,800	1,700	1,700
Regional Auto[3]							
Golden Gate Bridge	370	410	630	590	540	390	370
Bay Bridge	960	1,250	1,550	1,540	1,510	1,060	1,110
Bayshore Fwy (U.S. 101)	420	470	650	620	590	400	400
Interstate 280	420	470	650	620	590	400	400

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[1] Travel from only those projects on the list that are located inside the C-3 District. The list also contains development located in the greater downtown area outside the C-3 District; travel from those projects has been included in the list-based travel shown in the remainder of this section.

[2] Travel from the C-3 District only. The analysis used in the Downtown Plan DEIR assumes growth in regional travel that is not shown in the above data; it is discussed in the remainder of this section.

[3] Vehicle trip-ends; calculations made on the basis of 2.7 persons per carpool and 12 persons per vanpool. Person trip-ends on transit cannot be added to vehicle trip-ends to obtain total person trip ends because of the varying numbers of persons per vehicle.

Source: Environmental Science Associates, Inc.

"As shown in Table 9, travel demand from the Alternatives in the Downtown Plan EIR ranges from Alternative 1 (about 17% higher than the Downtown Plan) to Alternative 4 (about 5% lower than the Plan). Although there is a range, the spread is within the level of accuracy of the transportation analysis and thus, statistically, the transportation impacts of the Alternatives are equivalent to those of the Downtown Plan.

Several anomalies are apparent in the data shown in Table 9. The major anomaly is that, while the C-3 component of the list would generate about half as much travel as do the Downtown Plan and the five Alternatives, the list-based analysis yields projected travel demands within San Francisco (inside and outside the C-3-District) that exceed those generated by the Downtown Plan and the Alternatives. An explanation of this major anomaly is presented in the following paragraphs.

"The difference in total travel results in part from the different time frames of the list and the Downtown Plan EIR. The Downtown Plan EIR established 1984 as the baseline year and 1990 and 2000 as target study years. Estimates of growth were made on the basis of projections for each of the target years for the range of alternatives. In contrast, the projects included on the Cumulative List span a period from 1984 to sometime in the early or mid-1990's, when completion of all projects on the list or a similar amount of square footage would be expected.[8] This is one of the major reasons why results of impact analyses using these two forecasting methods are not directly comparable.

"The variations in travel by trip purpose (work, other) and by travel mode (as shown in Table 9) between the list-based method and the Downtown Plan EIR method can be explained by differences in the methodologies and data bases used to forecast the travel demand. The list-based analysis employs single-use trip generation data to estimate total travel through the process of adding together the trip generation estimates from all the individual buildings on the list. These single-use trip generation rates do not incorporate any discounting factors to account for trips going from one building to another within the Downtown. Studies for the Downtown Plan EIR have confirmed that there is considerable travel between land uses in the downtown area. Thus, the list-based analysis adds each trip as if it were a new trip in or out of the downtown and overestimates the total number of peak-hour trips.

"The Downtown Plan EIR travel demand model has refined the trip generation process by incorporating discounting factors that adjust the trip generation rates to give travel to and from the C-3 District as a whole; it does not include trips internal to the C-3 District. Although the Downtown Plan EIR process predicts proportionately more work travel than does the list-based analysis, observations show that the Downtown Plan EIR forecasts more closely resemble actual travel demand that would result from downtown development.

"The differences in distribution of travel among modes (shown in Table 9) are the products of refinements in the regional distribution and modal split analyses in the Downtown Plan EIR process. The list-based analysis assumes a static (unchanging over time) regional distribution and static modal splits. The Downtown Plan EIR analysis has incorporated changes in both the regional trip distribution (reflecting projected availability of housing) and the modal splits (reflecting projected availability of roadway and transit capacity in the future).

"The list-based analysis shows more San Francisco travel (as shown by larger Muni numbers for the list-based analysis in Table 9) than does the Downtown Plan EIR analysis, because the Downtown Plan EIR analysis projects a declining availability of housing in the City. Thus, as the downtown work force increases, the percentage of workers living in San Francisco would decrease. The list-based analysis assumes that the percentage of workers living in San Francisco would remain constant over time and thus overestimates the number of future employees living in the City and underestimates the number of regional commuters.

"Other differences in travel among the modes, particularly regional auto and AC Transit, are the result of the refined modal split process used in the Downtown Plan EIR. As the list-based analysis assumes that modal split remains constant over time, the list-based analysis is insensitive to the abilities of transit agencies and regional roadway systems to serve future demand. The Downtown Plan EIR analysis has assumed that the modal split would change over time in response to the increasing levels of congestion at the regional screenlines (described in the Downtown Plan EIR). Thus, because the Bay Bridge is at or near capacity in the p.m. peak hour eastbound, the Downtown Plan EIR modal split projects a proportionately lower increase in auto demand to the East Bay than does the list-based analysis. Similarly, for AC Transit the Downtown Plan EIR recognizes that current regional transit policy dictates no increases in AC Transit transbay service and thus, the ability of AC Transit to carry additional riders transbay will be restricted in the future. Use of this changing modal split is a refinement that allows the travel model to more accurately forecast travel demand and thus, the Downtown Plan EIR results represent a more accurate level of projection than has been possible using methods and data available to date.

"Various other factors cause differences in the travel demand projections between the two approaches. The Downtown Plan EIR and the Consultant's Report on Downtown Growth Management Alternatives (Environmental Science Associates, 1983) contain extensive discussions of the analyses and data used to forecast employment, land use (see Sections cited above) and transportation demand (see Section IV.E and Appendix J of those reports).

"TRANSIT

"The transit agencies serving downtown San Francisco carry approximately 60% of the peak-period employee work travel, as well as about 20% of the peak-period other travel. P.M. peak-hour and peak-period loadings on the local and regional transit routes were found to be near capacity for some of the routes in 1984 (see Table 10). The values shown in Table 10 are sums over the peak hour and the two-hour peak period. Within the peak hour, there would be periods of time when the loading ratios would be higher than those shown for the hour (peak-of-the-peak conditions). Individual transit vehicle loadings vary on a day-to-day basis because of fluctuations in ridership (demand) and because of variations in operating conditions caused by traffic congestion, equipment availability, and/or system breakdowns. Photographic examples of p.m. peak-hour loadings on Muni vehicles are shown in Appendix C, Figure C-1 pages A-46b to A-46d [pages A-42 to A-44, of this supplement].

"The 1981/82 transit ridership and loading data used in the Downtown Plan EIR analysis are summations of actual counts of individual transit lines for that period in time. Calculations are made on the basis of observed operating conditions, as opposed to

TABLE 10

OUTBOUND REGIONAL TRANSIT DEMAND AND SERVICE LEVELS

Transit Agency	1984			DOWNTOWN PLAN (2000)				1984 + CUMULATIVE LIST			
	Demand	P/S[1]	LOS[2]	Demand	P/S	LOS	Project Percent[3]	Rounded Demand	P/S	LOS	Project Percent[3]
Peak Hour											
Muni											
Northeast	7,100	1.16	D	8,800	1.05	D	0.1	8,700	1.04	D	0.1
Northwest	8,200	1.26	E	10,100	1.25	D	0.2	12,900	1.59	F	0.2
Southwest	13,500	1.45	E	16,600	1.42	E	0.1	17,500	1.50	E	0.1
Southeast	5,300	1.06	D	7,400	1.01	D	0.1	6,400	0.88	C	0.1
BART											
Transbay	16,100	1.53	F	27,900	1.42	E	0.1	21,900	1.12	D	0.2
Westbay	7,700	1.10	D	10,100	1.06	D	0.1	10,200	1.07	D	0.1
AC Transit	9,100	0.94	C	10,500	1.08	D	0.1	11,300	1.16	D	0.1
GGT Bus	5,300	1.00	C	8,500	0.91	C	0.1	6,800	0.73	B	0.2
GGT Ferry	800	0.57	B	1,500	0.38	A	0.1	1,100	0.28	A	0.2
Tiburon Ferry	200	0.40	A	300	0.60	B	--	200	0.40	A	--
SamTrans	1,900	1.12	D	3,100	1.19	D	0.1	2,300	0.88	C	0.2
CalTrain (SPRR)	3,100	0.61	B	4,900	0.79	C	0.1	3,800	0.61	B	0.2

TABLE 10 (continued)

	1984			DOWNTOWN PLAN (2000)				1984 + CUMULATIVE LIST			
Transit Agency	Demand	P/S[1]	LOS[2]	Demand	P/S	LOS	Project Percent[3]	Rounded Demand	P/S	LOS	Project Percent[3]
Peak period											
Muni											
Northeast	12,600	1.06	D	15,500	0.95	C	0.1	15,200	0.93	C	0.1
Northwest	13,100	1.13	D	15,300	1.05	D	0.2	20,600	1.41	E	0.2
Southwest	23,300	1.31	E	28,700	1.29	E	0.1	29,800	1.34	E	0.1
Southeast	9,100	1.00	C	12,100	0.88	C	0.1	11,000	0.80	C	0.1
BART											
Transbay	25,800	1.54	F	44,100	1.40	E	0.1	35,200	1.12	D	0.2
Westbay	11,300	0.80	C	14,600	0.77	C	0.1	15,400	0.81	C	0.1
AC Transit	14,000	0.95	C	17,000	1.16	D	0.1	17,500	1.19	D	0.1
GGT Bus	7,600	0.90	C	12,200	0.81	C	0.1	10,000	0.67	B	0.2
GGT Ferry	1,000	0.56	B	1,700	0.33	A	0.1	1,500	0.29	A	0.1
Tiburon Ferry	300	0.60	B	500	1.00	C	--	400	0.80	C	--
SamTrans	2,900	1.12	D	4,500	1.15	D	0.2	3,600	0.92	C	0.2
CalTrain (SPRR)	4,500	0.68	B	6,200	0.77	C	0.1	5,500	0.68	B	0.1

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[1] Passengers per Seat is the ratio of total demand to seated capacity.

[2] Level of Service is scale ranging from A to F that relates P/S ratios to passenger loading conditions on transit vehicles. (See Table C-1, page A-46 [page A-40 of this supplement]).

[3] The percent of demand generated by the project.

Source: Environmental Science Associates, Inc., Project Percent calculated by Environmental Impact Planning Corporation.

scheduled operations. Muni supplied the data for the Downtown Plan EIR analysis from its ongoing program of ridership checks. (The data supplied and collected for each transit agency are in the supporting documentation for the Downtown Plan EIR, on file with the Office of Environmental Review, 450 McAllister St., Fifth Floor, San Francisco, CA.) Muni was involved in the process of verifying the transportation analysis for the Downtown Plan EIR and as a result of that process, approved of the use of Muni data and the projections derived from that data.

"The Level of Service concept, similar to that developed for highway operations, has been applied to both bus transit and rail transit. Passengers per seat (i.e., total passengers divided by the number of seats) has been used as the measure of effectiveness to define the various level of service ranges. Table C-1, Appendix C page A-46 [page A-40 of this supplement], shows the relationship between Level of Service and passengers-per-seat (p/s) ratios for bus transit systems.

"During the p.m. peak hour in 1984, all of the transit agencies were found to be operating in Level of Service D or better, with the exception of BART Transbay where conditions were found to be at Level of Service F, and Muni in the Northwest and Southwest corridors, where operations were found to be in Level E. Although BART is a rail transit service, its cars have a unique seating configuration. The ratio of total capacity to seated capacity for a BART car (about 1.5) is equivalent to the ratio for bus transit; thus the bus transit Level of Service scale is applicable to BART. Level of Service F ("crush" or "jammed" loadings) on BART is in the range of 1.5 to 1.8 passengers per seat. Because BART operates on a centrally controlled system, the "crush" loadings would not increase passenger loading times (which causes deterioration of service) as would be the case on a bus transit system rather, the effects of "crush" loadings on BART would be reflected in increased passenger discomfort.

"The rail transit Level of Service scale is based on typical light rail transit systems for which total capacity is about 2.0 to 2.2 times seated capacity. The rail transit Level of Service scale would be applicable to Muni Metro, which provides about 50% of the seated capacity to the Southwest corridor. Because Metro vehicles can accommodate higher loadings (a ratio of 2.0 passengers per seat) than buses or trolleys (a 1.5 ratio), the Level of Service would be somewhat better than shown in Table 10. An exact estimate of Metro loadings is not possible without analysis of the Metro service separate from the remainder of Muni service to the Southwest; such analysis would be beyond the ability of the travel demand analysis to predict accurately over time, as discussed in the following paragraphs.

"With regard to the Muni data presented in Table 10, the Muni routes have been aggregated on a corridor basis and thus include two-directional travel on some routes that serve the Northeast and Southeast corridors. The Muni numbers cannot be added over the corridors to get a total for the system. Neither can capacity be shifted from one corridor to another. For instance, capacity in the Northeast corridor depends, in large part, on capacity that serves the Southeast portion of the City. The 15, 19, 30, 30X, 30AX, 30BX, 32, 41, 42 and lines pass through the downtown in two directions. Service on the above lines is interdependent. Thus, increases or decreases in capacity on one of the above lines directly affect service in the opposite direction. Service to the Northeast and Northwest corridors is also interconnected, as lines serving the Northwest must pass through the Northeast corridor and, thus, serve both areas. Muni ridership and capacity have been apportioned between both areas.

"Passengers-per-seat ratios are only one measure of adequacy of service. The constraints of operating on heavily used streets in and around the downtown cause transit-vehicle bunching, loss of running time and missed schedules, all of which reduce service, reliability, and ultimately, capacity. In some respects, this would not be evident from simple quantitative analysis. In addition to these inefficiencies inherent within the transportation system, there are other factors which would affect overall transit capacities. These include variability in daily and seasonal ridership for which an absolute capacity must be available, as well as transit riders who remain uncounted because their transit trips both start and end beyond the screenlines used in this analysis. Daily fluctuations in fleet availability also affect system capacity.

"Further, policy considerations dictate minimum operating conditions on certain lines; minimum headways that have been established to maintain transit access to areas served by those lines are not warranted on the basis of ridership alone. When averaged together, the ridership data from these lines may slightly distort overall ridership conditions.

"P.M. peak-period conditions on transit in 1984 were found to be equivalent to or better than peak-hour conditions. In some cases, where demand remains at peak-hour levels during the two-hour period, the passengers-per-seat ratios in the two-hour period are higher than in the one-hour period. This anomaly is the result of transit agencies' providing express (or additional) service during the peak hour, but not during the entire peak period. An example of this type of operation may be seen on BART, where three extra trains operate in transbay service in the peak hour but not in the rest of the peak period. Another factor involved is the distribution of demand (ridership) at uniformly high levels over the peak period.

"Both transit demand and capacity have been assumed to increase during the period 1984 and 2000. The discussions of transit capacity increases for the agencies are based on the Five-Year Plans and Capital Improvement Plans of the various transit agencies; they appear in Appendix J of the Downtown Plan EIR, pages J.25-J.26. This material, which is discussed below and summarized in Table 10, page 90 [page 48 of this document] is incorporated by reference. The future capacities were developed by applying percentage increases, expected in the future, to observed existing capacity. Thus, to the extent that the existing conditions contain inherent capacity reduction for missed runs, the future capacity projections have taken into account the inability of the transit systems to provide 100% of scheduled capacity. As noted above, the Muni analysis calculates capacity on the basis of all runs leaving the C-3 District in the p.m. peak. For all of the transit analyses, only peak-direction vehicles are counted.

"Future transit demand and loadings for the Downtown Plan in the year 2000 and for 1984-plus-the-Cumulative-List are shown in Table 10 for both the peak hour and the peak period. The transit demand from the project would range between 0.1% and 0.2% of the total peak-hour travel demand on the individual transit carriers in the year 2000.

"Peak-hour transit demand on Muni in the year 2000 would increase about 25% over 1984 levels in the Northeast, Northwest and Southwest corridors. Muni demand in the Southeast corridor would increase about 40% between 1984 and 2000. Peak-hour demand on the other agencies would increase between 30% and 70% between 1984 and 2000.

"Peak-period increases in demand would be between 15% and 70% during the 1984 to 2000 period. Overall peak-period travel would be expected to increase about 30% between 1984 and 2000. Peak period demand generated by the project would range from 0.1% to 0.2% of the total peak period travel demand. Peak-hour and peak-period passenger loadings would be worse than in 1984, although most systems would operate in acceptable conditions (Level of Service D or better). However, BART Transbay and Muni to the Southwest would be in Level of Service E during the peak hour and the peak period.

"Although the data in Table 10, are calculated on the basis of projections for the Downtown Plan, similar conditions would be expected under the five Alternatives in the Downtown Plan EIR. As shown in Table 9, total transit demand under Alternative 1 would be about 12% higher than under the Downtown Plan while transit demand from Alternative 4 would be about .9% lower than the Plan. As noted previously, these differences would not be statistically significant. In terms of Level of Service, the Downtown Plan would be equivalent to the five Alternatives.

"It is important to note that the Five-Year Plan improvements for the transit systems are designed both to provide for future demand increases, and to improve service levels from existing conditions. For new vehicles to expand system capacity rather than represent replacement on a one-to-one basis, operating revenues would similarly need to be increased. During the year 2000 peak hour, Muni service to the Southwest would exceed the desirable passengers per seat ratio of 1.25.[9] Although the transit demand in the corridor in excess of the desirable loading would be able to be accommodated under crowded conditions and thus would not be excess demand; (that is, not beyond capacity), demand in excess of the desirable loading would mean that additional transit service over that assumed to occur by 2000 would need to be provided to allow transit operations in the corridor to meet the goals set by Muni. To meet the goal of 1.25 passengers per seat in the peak hour, Muni would have to increase service by about 14% in the Southwest corridor over the amount of service assumed to occur in 2000.

"If transit service were not increased beyond the amounts assumed to occur by the year 2000 in the Downtown Plan EIR, transit operations (in terms of passenger comfort) would be slightly better than 1984 conditions. Peak-hour and peak-period passengers-per-seat ratios would be lower than 1984 ratios even though service (in some corridors) has been assumed to increase as much as 80% between 1984 and 2000.

"If the Downtown Plan's Goals regarding increased transit use were achieved, and the proposals in the Plan regarding transit service improvements were to be fully developed and in place, the impacts on transit agencies would be less than described above. If the Goals were achieved, transit agencies would experience greater levels of demand than under this analysis but overall passenger loadings would be lower (and within desirable levels) because of increased transit service availability that would come about if the proposals stated in the Plan are developed. Section V., Mitigation, contains measures that would provide the additional transit service required to mitigate the above impacts.

"Also shown in Table 10 is an independent analysis of the conditions that would result from adding travel from the Cumulative List to the 1984 base data, as is specified in the Transportation Guidelines. As noted above, the estimates calculated by adding the travel from the cumulative list to the 1984 base data are not specifically comparable to those from the Downtown Plan EIR method. The project travel would represent about 0.1% of the total travel on transit in the 1984-plus-the-Cumulative-List condition. As noted above, the List-based analysis overestimates the component of travel from San Francisco, as is shown in Table 10 by higher P/S ratios for Muni in the Northwest and Southwest corridors and lower P/S ratios for BART Transbay, SamTrans, and CalTrain than under the Downtown Plan EIR method. Under the 1984-plus-the-Cumulative-List conditions, Muni would not meet its service goals in the Northwest and Southwest corridors; this would require additional service increases of 27% and 20%, respectively, to meet Muni's goal of 1.25 passengers per seat in the peak hour. The other transit agencies would meet their service goals under these conditions.

"The Embarcadero Terraces project would generate approximately 63 new p.m. peak-hour exclusively Muni trips (Muni trips not involving transfers to other systems), of which 56 would be outbound from the project (see Table 8, page 80) [page 38 of this supplement]. Transit ridership from Embarcadero Terraces would be most noticeable on the Muni 32-Embarcadero and 42-Downtown Loop lines, which run adjacent to the site. The 32-Embarcadero would provide convenient access from the project to the SP-CalTrain station at Fourth and Townsend Sts., the Ferry Building, and the Northeastern Waterfront area. The 42-Downtown Loop would provide access to the heart of the Financial District, BART and AC Transit and SamTrans at the Transbay Terminal.

"Table 11, page 97, [page 55 of this supplement] shows existing (1984) and project ridership on the 32-Embarcadero and 42-Downtown Loop at the Embarcadero Terraces site. The existing level of Muni service has been used as the basis of the analysis. At present, the 32-Embarcadero is more lightly traveled inbound from the project area than outbound in the p.m. peak hour. Southbound, the 32-Embarcadero carries workers to the

TABLE 11: EXISTING AND PROJECT MUNI 32-EMBARCADERO AND 42-DOWNTOWN LOOP LEVELS OF SERVICE IN PROJECT VICINITY DURING P.M. PEAK HOUR

	Inbound			Outbound		
	Riders	P/S[a]	LOS[b]	Riders	P/S	LOS
32-Embarcadero						
Existing[c]	135	0.56	B	248	0.65	B
Existing plus Project[d]	182	0.76	B/C	264	0.69	B
42-Downtown Loop						
Existing[c]	261	0.60	B	192	0.50	A/B
Existing plus Project[d]	310	0.72	B	208	0.54	B

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[a] Passengers per Seat is the ratio of total demand to seated capacity.

[b] Level of Service is a scale ranging from A to F that relates P/S ratios to passenger loading conditions on transit vehicles (see Table C-1, Appendix C, page A-46 [page A-40 of this Supplement]).

[c] George Romeyn, Supervisor of Scheduling, SF Municipal Railway, telephone conversation, August 3, 1984.

[d] Project travel on basis of 1984 modal split. See Table 8, p. 118, for analysis of Muni operations outside the project vicinity in the year 2000.

SOURCE: Environmental Impact Planning Corporation.

downtown and CalTrain depot. The project would be expected to generate about 65 new trips away from the project (including transfers to other transit carriers; that is, more than Muni only trips are shown) on the 32-Embarcadero. Of these trips about 25% would be directed outbound from the project area and 75% would be inbound from the area. The increase in ridership on the 32 line would shift the level of service from B to B/C on the inbound runs; LOS would remain at B traveling outbound.

"The 42-Downtown Loop is more heavily traveled inbound than outbound during the p.m. peak hour. About 65 new trips (including transfers) would be created due to the project. Of these, about 25% would be outbound and 75% inbound. Project generated riders on the 42-Downtown Loop line would not change the level of service inbound but would shift it slightly outbound from A/B to B.

"While the Embarcadero Terraces project would increase ridership on the two Muni lines in the project area, most riders would still be able to find seats and operating conditions would be expected to be acceptable. Northbound riders would use the bus stops on the east side of The Embarcadero and on Sansome Street. Southbound riders would use the bus stops on Battery Street and The Embarcadero.

"Proposed Muni service improvements in the project vicinity would provide better and more convenient transit service for the project. The proposed Muni E-Line would run adjacent to the project site, providing direct rail service to the SP-Cal Train station, Market Street subway stations (for both BART and Muni Metro), and the southwest sections of San Francisco. It would also allow convenient transfers to Transbay Transit Terminal bus services. The construction of the E-line, while functioning in the area between Fisherman's Wharf and the CalTrain station as a replacement for the 32-Embarcadero, would provide new service to residents of the northeastern portion of the Marina District via a proposed extension to Fort Mason. The new access on the E-line may generate an increase in ridership over that now experienced on the 32-Embarcadero.

"The estimated 1981-82 (most recent available) net marginal cost (or increase in the deficit for Muni operations) per additional ride is $0.50.[10] This deficit-per-ride figure, because it is a marginal cost, is appropriate for small increases in Muni ridership (such as that requiring one or a few additional vehicle trips). Assessments of costs that would result from cumulative development require the inclusion of additional cost factors and may be best projected using average costs. It is reasonable to conclude that average costs would be significantly higher than marginal costs.

"The project would generate about 206 am and pm peak-period rides per day, which would generate an annual cost deficit to Muni of about $25,956.[10] This conclusion should be qualified because the Muni deficit-per-passenger-trip figure is based on 1981-82 data, and because the total project-generated deficit is calculated only for those riders who use Muni as their primary mode of transportation, excluding riders who would use a combination of transportation modes, such as Muni and Caltrain. More recent data that would allow a more precise estimate of costs are not available. The project would offset this deficit through its contributions to the General Fund, the Transit Impact Development Fee, and sales tax revenues.

"On April 27, 1981, the San Francisco Board of Supervisors approved Ordinance 224-81 to assess new downtown commercial development to support Muni. The ordinance established a one-time fee of up to $5.00 per gross square foot upon construction of new downtown office space, to provide funds for operating costs and capital improvements for Muni transit services. On September 27, 1984, the ordinance was upheld in San Francisco Superior Court. Further legal appeals of the ordinance may be made. Under the ordinance, the project could generate up to about $2.62 million in one-time fee revenues to Muni. This fee is intended to recover additional transit costs for the entire economic life of a building, and thus cannot be compared directly to the annual Muni deficit discussed above. However, the fees collected under the Ordinance would reduce the amount of General Fund revenue support necessary for existing and future Muni operations.

"The project would also offset the Muni deficit through its contributions to General Fund revenues, which would be derived from a variety of taxes levied on the proposed project. In the past, a portion of General Fund revenues have been allocated to Muni. The historical level of contribution of General Fund revenues to Muni may change, however, due to the recent court approval of the Transit Impact Development Fee. Because of the variable relationship of the sources from which Muni receives operating funds, the annual General Fund contribution to Muni from the project cannot be quantified.

"According to a memorandum entitled "Muni's Plans to Accommodate Downtown Growth," Dean Macris, Director of Planning, August 5, 1982, Muni expects to be able to meet projected cumulative demand due to downtown office development without new City taxes. According to the worst-case scenario in the memorandum, the San Francisco Municipal Railway Improvement Corporation, a nonprofit corporation established in 1971 for the purpose of selling bonds for transit improvements, may have to raise about $111 million through the sale of bonds over a ten-year period to finance Muni expansion. Muni would also be expected to receive additional revenues from the recent increase in the Federal gasoline tax, although this revenue source cannot be projected reliably at this time.

"For the 1983-84 fiscal year, the average net operating deficit per passenger trip for BART was about $1.06.[11] On the basis of about 73,080 rides per year, the estimated annual BART deficit attributable to the project would be about $77,465.[12] The project would generate a total of about $24,027 in revenues to BART, including about $17,480 in property tax revenues, and about $6,547 from the 75% of the 0.5% transit sales tax allocated to BART. This amount does not include the remaining 25% of the 0.5% BART sales tax revenue distributed by MTC among BART, Muni and AC Transit. After subtraction of BART's revenues from sales and property taxes that would be generated by the project, the net operating deficit of BART due to the project would be about $53,438. BART's operating deficit per passenger is likely to decline in real terms as planned service improvements become operational in the future.

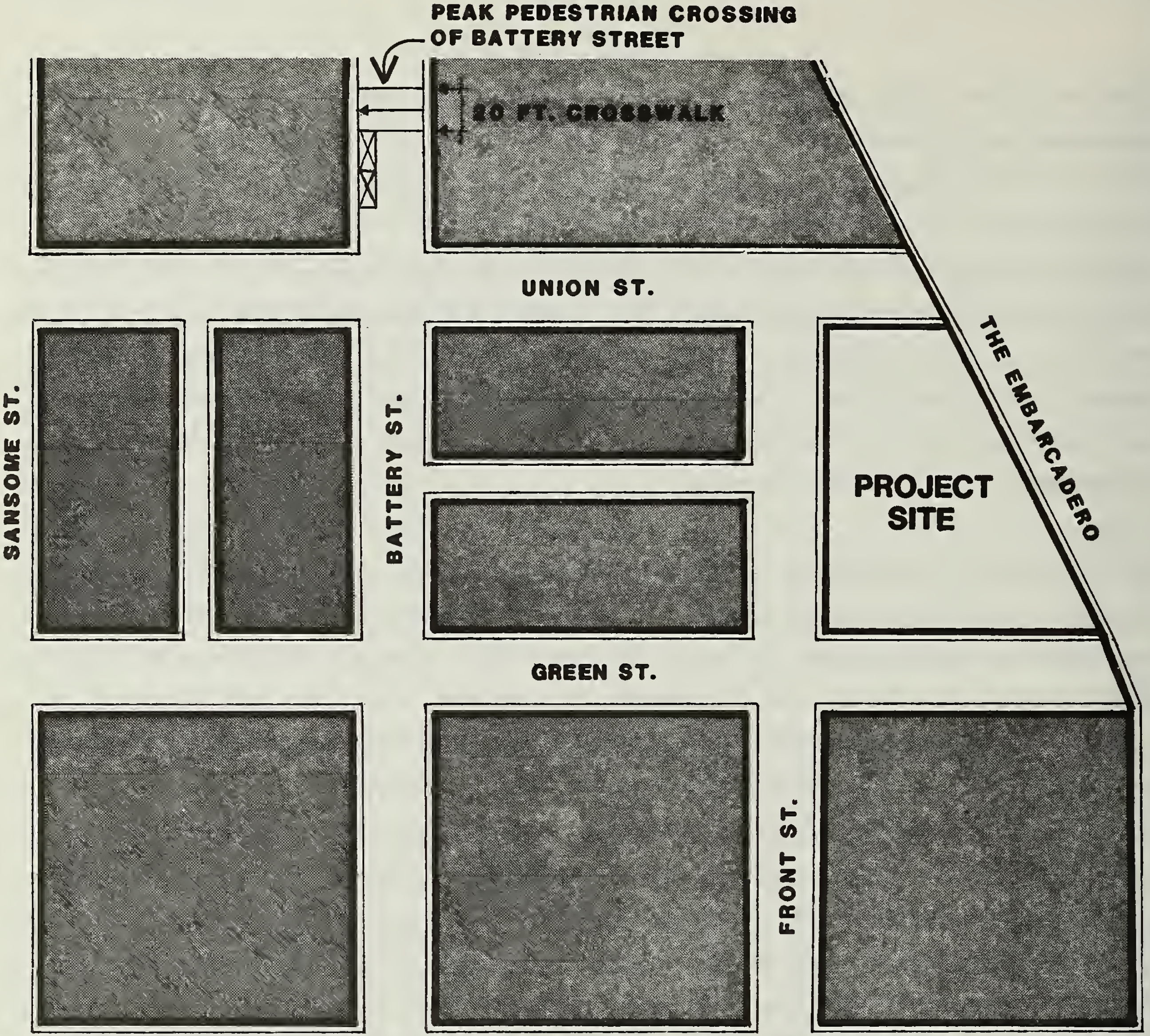
"PEDESTRIAN MOVEMENTS

"Pedestrian activity adjacent to the project site is primarily limited to commuters walking to and from the surface parking lot on the site and the parking garage immediately south of the site. Existing pedestrian flow conditions were surveyed along sidewalks and crossings on Front Street (See Figure 20, page 98c [page 60 of this supplement]). (See Appendix C, Page A-47, for definition of pedestrian LOS.) Existing flows are generally in the "open" range with virtually no pedestrian conflicts.[13] Pedestrian flows are also concentrated crossing Battery Street north of Union Street. Bus stops for Muni line 42 and Golden Gate Transit routes are located on the west side of Battery Street between Greenwich and Union Streets (for service toward the downtown) and the east side of Sansome Street at Greenwich Street (for service toward the Embarcadero and North Bay). The crosswalks on Battery Street were observed during the p.m. peak hour.[13] The pedestrian flows are "open" throughout the peak hour and during the peak five-minute period of the hour.

"Mid-day pedestrian volumes are generally higher than in the p.m. peak hour. However, p.m. peak hour pedestrian flows would be more concentrated, with major flows, through the crosswalks analyzed, towards Muni and Golden Gate Transit bus stops, and, due to higher vehicle flow rates, would present the greatest potential pedestrian/vehicle conflicts. The project would generate about 230 p.m. peak-hour total pedestrian trips and 345 total pedestrian trips during the peak midday hour, (based upon City guidelines[1]). Of the total p.m. peak-hour pedestrian trips about 150 would be directed to the Muni and Golden Gate Transit bus stops west on Battery and Sansome Streets. If all 230 p.m. peak-hour pedestrians crossed Battery at the signalized mid-block crossing, the pedestrian flows would generally remain open during the peak hour but would worsen slightly to unimpeded during peak five-minute periods. Since entrance and exits to and from the parking garage would be on Green Street, and the entrance to the office building would be on Battery, it is not anticipated that traffic across the Green Street sidewalk would cause any disruption in pedestrian flow that would change the level of service.

"TRAFFIC

"The analysis of traffic impacts has been conducted on two levels: one level of analysis considered impacts at the regional screenlines, the second level of analysis considered impacts at intersections in and near the downtown.



TWO-WAY FLOW RATES AND CONDITIONS AT PEAK BATTERY ST. CROSSING

EXISTING	WITH PROJECT
● PEAK HOUR AVERAGE=0.26 PERSONS/ MINUTE/FT. OF CROSSWALK WIDTH 'OPEN' FLOW	● PEAK HOUR AVERAGE=0.43 PERSONS/ MINUTE/FT. OF CROSSWALK WIDTH 'OPEN' FLOW
● PEAK 5 MIN. PERIOD=0.41 PERSONS/ MINUTE/FT. OF CROSSWALKWIDTH 'OPEN' FLOW	● PEAK 5 MIN. PERIOD=0.68 PERSONS/ MINUTE/FT. OF CROSSWALK WIDTH 'UNIMPEDED' FLOW

☒ MUNI AND GOLDEN GATE BUS STOPS

SOURCE: EIP CORPORATION

NOT TO SCALE

Embarcadero Office Terraces

EXISTING AND PROJECTED PEDESTRIAN FLOW CONDITIONS DURING PM PEAK

20

"Regional Freeway Analysis

"Analysis of traffic conditions at the regional screenlines has been conducted for both the p.m. peak hour and the two-hour p.m. peak period. A.m. peak traffic conditions at regional screenlines have the effect of metering the amount of traffic that reaches the downtown from outside of the City. This analysis has considered p.m. peak conditions. P.m. conditions are usually most severe on freeways and streets within San Francisco, whereas a.m. peak conditions are most severe at locations outside the City.

"The regional freeway system that serves San Francisco is an extensive network of roadways that also provides service to most of the major urban centers in the Bay Area. Consequently, there are many areas of commute-related congestion, some of which may experience worse conditions than at the screenlines analyzed in the Downtown Plan EIR and in this document. As noted in the Downtown Plan EIR, the screenlines were selected on the basis of their relationship to travel leaving San Francisco and thus, by their definitions, the screenlines are points of maximum effect of travel from San Francisco; at points further removed from the screenlines, San Francisco travel would be a lesser percentage of the total and thus the overall effects of San Francisco travel would be less than at the screenlines.

"Traffic demands at the regional screenlines in 1984 (see Table 12, page 98f [page 62 of this supplement]) during the p.m. peak hour were found to use between 90% and 100% of the available capacity on the freeways and bridges. Although the eastbound capacity of the Bay Bridge is calculated to be 9,000 vehicles per hour (vph), the 1984 peak-hour demand shown in Table 12 represents the effective eastbound capacity. The volume figures shown in Table 12 for 1984 for the one-hour and two-hour periods are averages of several days; thus, values for individual days may be different than the average.

"Peak-hour freeway operating conditions in 1984 were found to be generally in Level of Service D to E conditions, which would indicate unstable flows in the 35 mph to 45 mph range. Table C-4, Appendix C, page A-47b [page A-47 of this supplement] shows the Level of Service for freeway operations. Peak-of-the-peak conditions within the peak hour were found to be worse than the hourly conditions because of surges in traffic demand during the peak hour. Conditions during the peak-period at the screenlines were found to be similar to those experienced during the peak-hour.

TABLE 12
OUTBOUND REGIONAL AUTO DEMAND

	1984		DOWNTOWN PLAN (2000)		1984 + CUMULATIVE LIST	
Regional Auto Corridor	Capacity[1]	Volume[2]	Demand	Project Percent	Demand	Project Percent
Peak Hour						
Bay Bridge (I-80)	9,000	8,540	9,790	0.1	9,480	0.1
Golden Gate Bridge (US-101)	7,200	6,740	7,150	0.1	7,100	0.1
U.S. 101 (south of Harney Way)	8,000	7,390	8,400	0.1	7,800	0.1
I-280 (between Alemany Blvd. and San Jose Avenue)	8,000	7,610	8,650	0.1	8,020	0.1
Peak Period						
Bay Bridge (I-80)	18,000	17,880	19,330	0.1	18,460	0.1
Golden Gate Bridge (U.S. 101)	14,400	13,870	14,850	--[3]	15,380	--
U.S. 101 (south of Harney Way)	16,000	14,200	16,530	--	14,870	--
I-280 (between Alemany Blvd. and San Jose Avenue)	16,000	13,620	15,890	--	17,290	--

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Source: Environmental Science Associates, Inc.; Environmental Impact Planning Corp.

[1] Although the capacity of the Bay Bridge is calculated to be 9,000 vehicles per hour (vph), the 1984 peak-hour demand shown above represents the effective capacity.

[2] The volumes for 1984 for the one-hour and two-hour periods are averages of several days and, thus, values for individual days may be different than the average.

[3] Less than 0.05 of one percent

"As shown in Table 12, demand during the peak hour in the East Bay and Peninsula corridors would be expected to increase about 15% between 1984 and 2000. Peak-hour demand in the North Bay corridor would increase by about six percent between 1984 and 2000. The project's regional travel demand, about 23 p.m. peak-hour and 31 peak-period outbound regional vehicle trip-ends would represent less than 0.1% of the total demand for all corridors in the year 2000. Both the East Bay and Peninsula corridors would have excess peak-hour demand that would not be met during the peak period.[14] The North Bay corridor would have excess demand in the peak period. Excess auto demand would result in either a spreading of the demand into the hours adjacent to the peak period or in increased transit and ridesharing use should additional transit service (beyond that assumed to occur by the year 2000) or ridesharing incentives be provided.

"Operating conditions at the regional screenlines would be at or near capacity in Level of Service E. Traffic flow conditions would be expected to be very unstable and could experience temporary flow interruptions throughout the peak period. Peak-of-the-peak conditions would be prevalent during the peak hour and might extend into the peak period. The overall two-hour commute period would not be expected to increase substantially in the future. Rather, the occurrence of peak-of-the-peak conditions, now less than one hour, would most likely expand to fill the one-hour peak.

"As shown in Table 12, the list-based cumulative analysis, while not comparable to the year 2000 data, produces similar estimates of future demand. The results reflect the tendency of the list-based method to overestimate regional auto travel. The project would represent about 0.1% of the regional auto demand in this condition. The Bay Bridge and I-280 would have excess demand during the peak hour: the Bay Bridge, the Golden Gate Bridge, and I-280 would have excess demand during the peak period. The same conclusions noted above regarding future operating conditions would apply to this condition as well.

"Intersection Analysis

"The proposed project's 50 on-site parking spaces would be used by the occupants of the project's office space, displacing the users of the existing 269-space surface parking lot. The displaced vehicles could not park in a single location in the Northeast Waterfront and thus they would be dispersed throughout the area, making it impossible to predict specific traffic impacts of the displaced vehicles. It is not clear where the vehicles would park, and it is also possible that the travel patterns of the current parkers could change, including shifts to transit use, parking on the periphery, and so on. It would not be practical to survey the current parking lot users about possible future transportation mode choices because changes in user patterns could occur in the timeframe for impact projection or by the time of project completion.

"Although it is not possible to accurately project impacts of the project and the displaced users of the existing parking lot on the immediately adjacent intersections, it is possible to project cumulative impacts which include the proposed project and the users of the existing parking lot, on the major feeder intersections providing access to the project area: Broadway/Battery, Broadway/Sansome and Lombard/Sansome. Broadway/Battery and Broadway/Sansome serve the project area as feeders to and from the Embarcadero Freeway ramps and are points of maximum congestion in the Financial and Greater Downtown districts. Lombard/Sansome is the principal intersection through which traffic bound for the North Bay would pass. Conditions on these streets were assumed to represent the worst-case traffic impacts of the project. Impacts from the project on other street would be less because traffic on them would be more dispersed.

"Traffic observations at Sansome/Green and Battery/Green indicate that total volumes passing through those intersections are below those volumes experienced at Broadway/Battery, Broadway/Sansome and Lombard/Sansome the intersections controlling traffic flow to the area. Analysis of these intersections would suggest a traffic flow rate lighter than than at the intersections serving as feeders to the project area. Therefore, the EIR has focused on those key intersections where total traffic volume would be highest and the potential for impacts most pronounced.

"Intersections immediately adjacent to the project site, including Green/Front, Green/Battery and Green/Sansome were observed to operate at essentially free flow conditions (Level of Service A), less than 50% of capacity.[13] The proposed project would cause a net decrease of 219 spaces on site, and a proportional decrease in flow through the intersections would be expected to result in the intersections remaining at Level of Service A.[13]

"Total peak-hour outbound auto traffic generated by the project is estimated to be about 55 vehicles. If 36 vehicles were to travel through the Broadway/Battery or the Broadway/Sansome intersections on their way to the East Bay, Peninsula, south and west San Francisco, there would be about a 1% increase in traffic flow at those intersections. If 19 vehicles passed through the Lombard/Sansome intersection on their way to the North Bay, traffic volumes there would increase by about 2%. All intersections would remain in their existing levels of service with the addition of project traffic. Traffic flow fluctuates on a daily basis and flow variations of 10% or less would not be measurable.

"The localized aspects of cumulative development on streets and major intersections in the vicinity of the project site were prepared using underlying traffic growth factors representing "worst case" scenarios. It is estimated that in the City's northeast quadrant, traffic volumes will grow 8% by the year 1990 and 11% by the year 2000.[15] These growth factors include traffic generated by the proposed project plus traffic generated in the surrounding area by cumulative development. The traffic generated by other projects in the area would probably use the intersections analyzed.

"Table 13 shows the levels of service (LOS) at the intersections of Broadway/Battery, Broadway/Sansome, and Lombard/Sansome as they currently exist, with the proposed project, and as estimated in 1990 and the year 2000 (including the project). Levels of service descriptions are shown in Table C-3, Appendix C, page A-47a [page A-46 in this supplement].

"PARKING

"The estimated parking demand (both long-term and short-term) from the C-3 District in 1984 was found to be about 45,300 spaces, which would occupy about 94% of the 48,000

TABLE 13

EXISTING AND PROJECTED INTERSECTION SERVICE LEVELS
IN THE PROJECT VICINITY

	Service Levels							
Intersection	Existing		With Project		Year 2000		1984 + Cumulative List	
	LOS[2]	V/C[3]	LOS	V/C	LOS	V/C	LOS	V/C
Broadway/Battery[1]	C/D	0.78	C/D	0.79	D	.87	D	.84
Broadway/Sansome[1]	B	0.63	B	0.64	B/C	.70	B/C	.68
Lombard/Sansome[4]	A	0.30	A	0.32	A	.33	A	.32

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[1] Counts conducted by EIP Corporation in May 1982.

[2] Level of service descriptions and relationships to V/C ratios are shown in Appendix C, Table C-3, page A-47a [page A-46 of this supplement].

[3] Ratio of intersection traffic volume to capacity.

[4] Counts conducted by EIP Corporation, July 19, 1984

parking spaces in and near the C-3 District.[16] The short-term parking demand, while representing about 25% of the equivalent daily demand, is about 65% of the daily vehicle travel. Although the equivalent daily demand would leave about 10% of the parking supply vacant, surges in short-term demand (more travel in one period than in another period) can cause temporary localized overloads of parking facilities within various portions of the downtown, even though parking may be available elsewhere in the downtown.

"The C-3 District would generate demand for approximately 58,000 equivalent daily parking spaces in the year 2000 under the Downtown Plan, an increase of 28% from 1984. Short-term demand would continue to represent about 25% of the total demand. The parking supply has been assumed to be about 51,000 spaces. There would be a parking deficit of about 7,000 spaces in the year 2000 if vehicular demand occurs as projected. However, as shown in Table 10, the analysis for the year 2000 forecasts excess auto demand in the peak hour and the peak period. If the excess demand is accommodated on transit or ridesharing, then the overall parking demand would decrease from the above estimate by about 9,300 spaces. If the Goals of the Downtown Plan are met, total parking demand in the year 2000 would be about 48,100 equivalent daily spaces, an increase of six percent over 1984. If the Goals were achieved, there would not be a parking deficit.

"The list-based analysis shows future demand for 11,400 spaces from projects in the C-3 District, which, when added to the 1984 data, would be a total demand of 56,700 spaces. While similar to the 58,000 space (unmitigated) demand for the year 2000, the list-based demand is not comparable for the reasons stated above, in particular because the list-based analysis assumes a static modal split and thus overestimates future auto demand.

"Although the parking demands discussed above are calculated on the basis of projections for the Downtown Plan, similar conditions would be expected under the five Alternatives in the Downtown Plan EIR. Although not shown in Table 9, parking demand from the C-3 District under Alternative 1 would be about 4% higher than under the Downtown Plan, while that under Alternative 4 would be about 1% lower than that under the Plan.

"Although the project would not be located in the C-3 District, C-3 District parking demand would have an effect on local parking occupancy.

"The project's parking demand has been calculated on the basis of trip generation and modal split data. Based upon the project's travel patterns, parking demand would be about 84 spaces, calculated as follows:

- 1,024 daily work trips x 22% auto/1.6 persons per auto[3]/2 one-way trips per auto = 70 long-term parking spaces.
- 1,942 daily non-work trips x 10% auto/1.3 persons per auto[3]/2 one-way trips per auto/5.5 turnovers daily[3] = 14 short term parking spaces.

Total project demand = 84

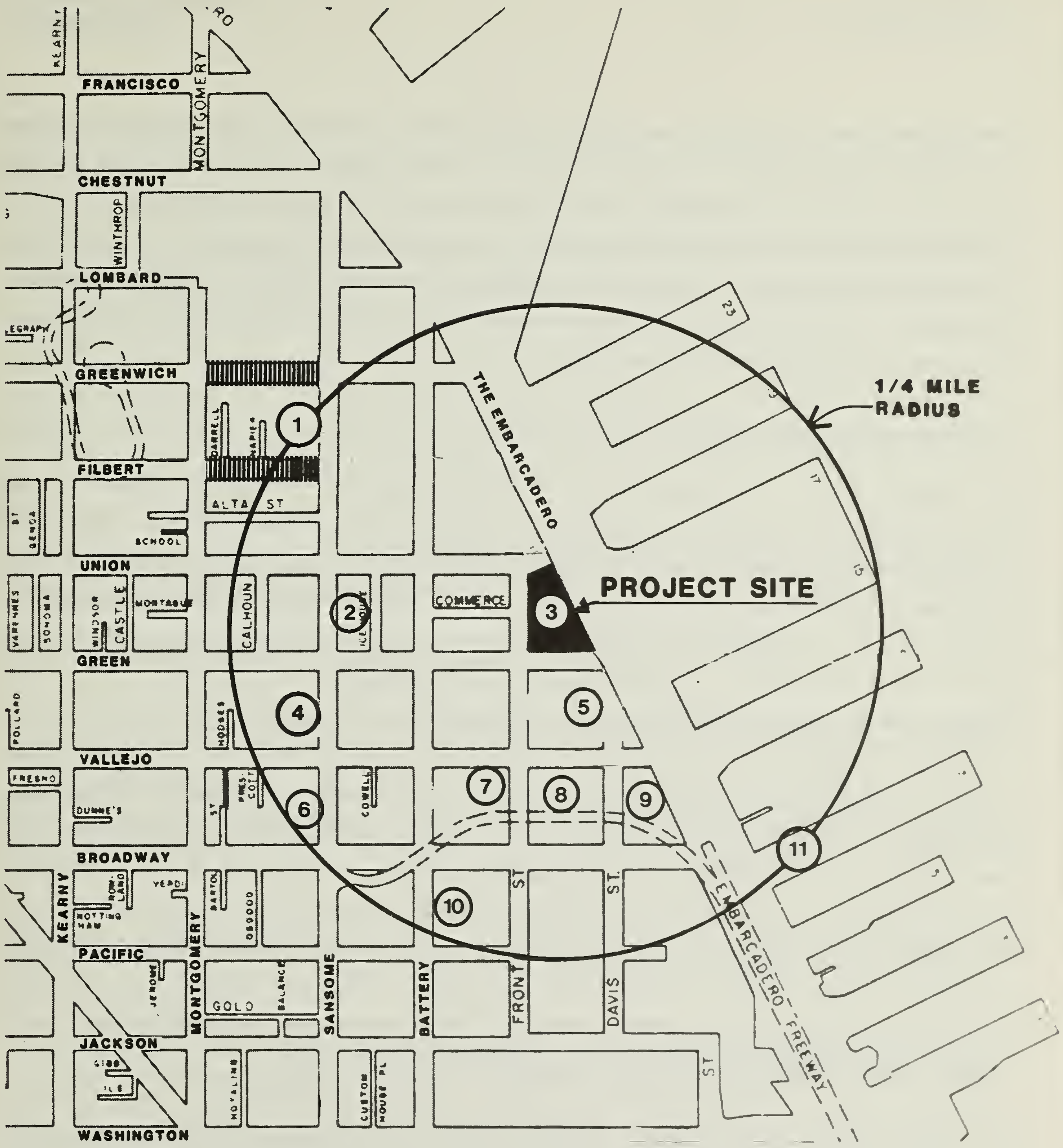
"The proposed project would include on-site parking for 50 cars in the basement parking area. With valet parking, 125 vehicles could be parked on-site which would accommodate demand for the project. Access to the parking would be via a ramp from Green Street. The project site is currently occupied by a 269-space open parking lot. The estimated parking demand, 84 spaces, and the net loss of 219 existing parking spaces (269-50 = 219) would create a deficit of 303 parking spaces (not including valet parking). The City Planning Code requires 256 parking spaces for the project. A Variance would be required because the number of parking spaces provided would be 206 fewer than required by code.

"Within a one-quarter mile walking distance (two-three blocks) of the site there are 11 off-street parking garages and lots containing about 2,079 spaces (Figure 21, page 98L [page 69 of this supplement]). During a mid-day survey, the various lots and garages were 79% filled, with 1,638 spaces occupied and 441 spaces vacant.[17] The project site (included within the overall survey), a 269-space surface lot, was 93% filled (250 spaces occupied) during the field survey. Although, based on two surveys performed for the project, area parking occupancy has decreased by about 3% since 1982, a variation of this magnitude is within the range of error of single day parking surveys of this type. Parking occupancy is known to vary depending on weather, season, time of day and other factors.

"With the loss of the current parking lot and added parking demand, the parking occupancy (in the area surveyed) would increase from 79% to 93%, virtually saturating the existing parking supply. As parking occupancy approaches saturation it is likely that commuters would be diverted from single occupant auto travel. With the demand, parking rates would increase and parking itself would be less convenient. These factors would make carpool and transit services more attractive. If these diversions from single occupant auto commuting were to occur, the parking demand would probably not reach 100%.

"The project's freight loading needs have been calculated according to City guidelines.[18] The project's freight loading demand would be:

o	139,000	gsf office space @ 0.1 space/10,000 sq. ft.	= 1.39 spaces
o	3,000	gsf retail space	= 0.00 spaces
		Total	= 1.39 spaces



SOURCE: EIP CORPORATION

SCALE 0 250 500 1000 FEET

③ PUBLICLY ACCESSIBLE PARKING LOT OR GARAGE

▥ STAIRS

— — BOUNDARY OF PARKING SURVEY

Embarcadero Office Terraces

EXISTING OFF STREET PUBLIC PARKING FACILITIES

21

"The project would include a single loading dock on Green Street. City Planning Commission policy would require that the project have 0.1 space per 10,000 square feet of gross floor area. The calculation yields a requirement for approximately one off-steet loading space. Peak loading demand could exceed the single space capacity. Based on a City study, the peak hour truck activity would be about 25% higher, resulting in a peak demand for one to two spaces. During these periods, a delivery vehicle would either seek curb space or double park on Green Street.

"CONSTRUCTION IMPACTS

"The project would be constructed over an 18-month period, employing between 80 and 110 employees at any one time during construction.[19] If construction employees exhibited the same travel characteristics as other downtown employees, up to 15-20 auto trips would be generated during the p.m. peak hour. These trips would not change traffic service levels on the adjacent street network. The 15-20 construction employees' vehicles could be accommodated in existing parking lots and garages in the project area. (See discussion of existing parking supply, page 981) [page 68 of this supplement].

"Truck travel would be greatest during either the basement excavation or concrete placement. It is estimated that peak activity would not exceed 50 trucks daily, with fewer than five trucks during the p.m. peak hour.[20] This truck activity would add less than one percent to streets such as Battery and Sansome and the traffic flow characteristics would not worsen as a result of the truck travel. During excavation and concrete placement, trucks would probably queue on Front Street and these back-ups could temporarily disrupt through traffic. See page 122 for a mitigation measure that would prohibit construction truck traffic during peak traffic flow periods.

"Immediately adjacent to the site, traffic and pedestrian flows are light along Union, Front and Green Streets.[21] To the extent that construction activity would encroach onto sidewalk areas, pedestrian flows would be disrupted. This activity could also temporarily block portions of the adjacent streets. However, it is not projected that this disruption would cause vehicle service levels (on Union, Front and Green Streets) to drop below stable conditions (service level C or better), or cause pedestrian flows to change from open to unimpeded.

"Pedestrian activity would drop during construction because the main pedestrian destination for the site, the existing parking lot, would be removed. Sections of the sidewalk might have to be blocked for safety. Pedestrians would then be rerouted to sidewalks across the street or to a converted curb lane. A pedestrian facilities plan (covering the period of construction) would be required by the City's Bureau of Engineering prior to the issuance of a building permit. Such a plan would include signing and pedestrian detours."

"[1] San Francisco Department of City Planning, Guidelines for Environmental Review: Transportation Impacts, September 1983.

"[2] Caltrans, Tenth Progress Report on Trip Ends Generation, July 1975.

"[3] San Francisco Department of City Planning, Office of Environmental Review, Final Environmental Impact Report for The Downtown Plan, EE81.3, certified October 18, 1984. This document is an analysis of projected growth in the C-3 District to the year 2000 under the Downtown Plan and five alternatives. The transportation analysis in the EIR includes projections of future modal splits for work and non-work travel for the p.m. peak period, peak hour and daily time periods. This document is on file and available for public review at the Office of Environmental Review, 450 McAllister Street, Fifth Floor.

"[4] Levi's Plaza FEIR, EE77.256, December 14, 1978, page 100; and Meg Franklin, Employee Services Department, Levi Strauss Corporation, telephone conversation, May 20, 1983.

"[5] The Downtown Plan EIR contains about 50 pages of text devoted to the description of transportation impacts in the greater downtown area, as well as an additional 30 pages of text describing transportation mitigation measures. The information in this EIR is not intended to be a comprehensive summary of the transportation analysis in the Downtown Plan EIR, but rather summarizes portions relevant to the proposed project and its contribution to cumulative impacts. For details and assumptions used to arrive at the data and results presented in the Downtown Plan EIR, see Sections IV.E, Transportation Setting and Impact, Section V.E, Transportation Mitigation, and Appendix J, Transportation and Circulation Analyses and Methodologies, of the Downtown Plan EIR, which are incorporated by reference into this report and summarized in the text as appropriate.

"[6] Metropolitan Transportation Commission, Traffic Survey Series A-48 and MA-60, Spring 1977 and Spring 1983.

"[7] The analysis of historic trends in travel patterns is from the following sources: Metropolitan Transportation Commission, Travel Observations of the Bay Bridge Corridor, October 21, 1981; Homburger and Dock, Trends in Traffic Patterns at the Bay Bridge and Caldecott Tunnel, U.S. Department of Transportation, DOT-BIP-WP-32-3-77, July 1977; telephone survey of 500 drivers conducted in April 1980 by Golden Gate Transit, data supplied by Alan Zahradnik, Transportation Planner, on February 16, 1983; Office of the Auditor-Comptroller, Comparative Record of Traffic for the Month of November, May 27, 1937 through November 30, 1982, Golden Gate Bridge, Highway and Transportation District; San Francisco Municipal Railway Planning Division, Projections of Future Muni Demand and Vehicle Requirements, October 1982; San Mateo County Transit District, SamTrans Five-Year Transportation Development Plan: 1983-1988, April 1983; California Department of Transportation, CalTrain Caltrans/Southern Pacific Peninsula Train Service Five-Year Plan 1983-1988, July 1983; and traffic volume counts from Department of Public Works, Bureau of Engineering, Division of Traffic Engineering and from 1983 San Francisco Cordon Count, JHK and Associates, July 1983.

"[8] See Downtown Plan EIR, pages II.9-II.11 for a comparison of the cumulative list projections with those of the Downtown Plan EIR.

"[9] San Francisco Municipal Railway, Short-Range Transit Plan 1983-1988, July 1983.

"[10] This deficit-per-ride figure is based upon information provided in: Touche Ross & Co., Transit Impact Development Fee Cost Study, Fiscal Year 1981-82, July 1983, Corrected September 9, 1983, and consultation with Bruce Bernhard, Chief Accountant, San Francisco Municipal Railway, telephone communication, October 11, 1984. The calculation of the peak-period marginal deficit (additional cost per ride minus additional revenue per ride) was done by EIP. The deficit due to the project would be: 206 peak-period trips per day x 252 working days per year x $0.50 deficit = $25,956. The cost deficit estimate is based on the assumption that essentially all vehicles are operating at capacity during peak periods and additional riders would require new vehicle trips. During off-peak periods, it was assumed that all vehicles operate with excess capacity, resulting in an average off-peak marginal cost of zero. These cost estimates are appropriate for project costs to Muni of a single office building. Assessments of costs that would result from cumulative development require the inclusion of additional cost factors and may be best projected using average cost data. Muni does not have data that would enable it to estimate the average cost per passenger trip. It is reasonable to conclude that average costs would be significantly higher than marginal costs.

"[11] Ward Belding, Supervisor, Office of Research, BART, telephone conversation, May 1984. The $1.06 average deficit per trip is based on all operating costs and revenues for the entire system and is not specific to San Francisco trips. Available data from BART do not enable peak and non-peak-period costs to be differentiated.

"[12] 290 BART trips per day x 252 days/year x $1.06 = $77,465.

"[13] Field survey by Environmental Impact Planning Corporation, Thursday, May 20, 1983.

"[14] Table IV.E.4, p. IV.E.36, of the Downtown Plan EIR contains a discussion of the implications of excess demand at the regional screenlines.

"[15] Underlying growth factors were derived from background reports for the Downtown Plan EIR and assume a less than complete implementation of the Downtown Plan goals. Achievement of Plan goals would greatly reduce these impacts. Gail Bloom, Transportation Planner, Department of City Planning, telephone conversation, January 3, 1985.

"[16] The parking survey data and other supporting calculations and data used in the Downtown Plan EIR transportation impact analysis are on file and available for public review at the Office of Environmental Review, Department of City Planning, 450 McAllister Street, Fifth Floor, San Francisco, CA.

"[17] Field survey by Envirionmental Impact Planning Corporation, Thursday, May 13, 1982; updated by Environmental Impact Planning Corporation, Tuesday, February 19, 1985.

"[18] San Francisco City Planning Commission, Resolution No. 9286, January 21, 1982, Exhibit A, page 2.

"[19] Estimate by George W.Nickelson, Environmental Impact Planning Corporation, based upon project construction costs.

"[20] Estimate by George W. Nickelson, Environmental Impact Planning Corporation.

"[21] Field review by Environmenal Impact Planning Corporation, Thursday, May 13, 1982."

E. AIR QUALITY

The following material replaces paragraphs 1 through 10 of "I. Air Quality" in the DEIR, pages 99 through 102.

"Upon completion, the project would affect air quality in two ways: emissions would be generated by project-related traffic and by combustion of natural gas for space and water heating. Transportation sources would account for over 95% of project-related emissions.

"Construction activities would generate pollutants in the project vicinity. Trucks and equipment would release exhaust that would affect neighboring buildings during construction hours. Site preparation and construction activities would generate suspended particulate matter. Although emission factors upon which to base estimates of the resulting atmospheric concentrations of particulates are not available, violations of the state 24-hour total suspended particulate (TSP) standard might result in the immediate vicinity of the project.

"Projected daily emissions of pollutants in 1990 from project-generated traffic, and from cumulative development traffic, based on the March 10, 1984 list of cumulative office development in downtown San Francisco (Appendix F, Table F-2, pages A-66 to A-69) [pages A-56 to A-59 of this supplement] are shown in Table 14 page 100 [page 75 of this supplement]. Table 14 also shows projected daily emissions in 1990 and 2000 for C-3 District development projected by the Downtown Plan EIR (EE81.3, certified October 18, 1984), and to total emissions projected for the entire Bay Area by the 1982 Bay Area Air Quality Plan. The project would contribute about 0.8% of the total air pollutant emissions generated by cumulative list projects, and about 2% of the total emissions generated by Downtown Plan development in 1990. Alternative 1 to the Downtown Plan (covered in the Downtown Plan EIR) would generate about 38% more emissions in 2000 (from development between 1990 and 2000) than would the Downtown Plan. Alternative 4 would generate about 7% less emissions than would the Downtown Plan. Emissions generated by Alternatives 2, 3 and 5 would fall within this range. The types of air quality impacts under these alternatives would be the same as those under the Downtown Plan; their magnitudes would vary in proportion to their differences in emissions.

TABLE 14

PROJECTED DAILY POLLUTANT EMISSIONS

(tons/day)[1]

Pollutant	Project 1990[2]	Cumulative List 1990[3]	Downtown Plan[4] 1990	Downtown Plan[4] 2000	Bay Area[5] 1990	Bay Area[5] 2000
Hydrocarbons	.01	1.4	0.6	0.6	428	428
Nitrogen Oxides	.02	1.8	0.8	0.8	558	610
Carbon Monoxide	.16	17.0	6.8	6.6	1,952	1,883
Particulates	.02	2.7	1.1	1.3	562	649
Sulfur Oxides	.002	0.2	0.1	0.1	194	233

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[1] Project, Cumulative List, and Downtown Plan emissions calculated using BAAQMD, EMFAC6C vehicular emission factors. Emission of HC, NOx, and CO include an assumed six minutes of idling time per vehicle trip. Emissions of TSP include dust disturbed from roadway surfaces.

[2] Based upon daily average of 9,500 miles traveled.

[3] Incremental emissions of downtown-area development based on list of projected Cumulative Office Development in Downtown San Francisco as of March 10, 1984 (see Appendix F, Table F-2, pp. A-66 to A-69) [pages A-56 to A-59 of this supplement].

[4] Incremental emissions of C-3 District development, per The Downtown Plan EIR, Table IV.1.2,p.IV.1.12.

[5] Cumulative total emissions of Bay Area development, per ABAG, BAAQMD, MTC, 1982 Bay Area Air Quality Plan, pp. 42, 53, and 112.

Source: Environmental Impact Planning Corporation.

"Motor vehicle trips associated with downtown development would emit more nitrogen oxides (NOx) than hydrocarbons (HC), both of which are chemical precursors of ozone, while emissions from the building's natural gas combustion would consist primarily of NOx. On the basis of the Livermore Regional Air Quality Model (LIRAQ) ozone simulations conducted for the 1982 Bay Area Air Quality Plan, incremental NOx emissions in excess of incremental HC emissions, could lead to a slight decrease in peak ozone concentrations in the Bay Area. This relationship between NOx and HC emissions would hold both under the cumulative list scenario and the Downtown Plan scenario shown in Table 14. Thus, emissions of HC and NOx generated by the project and by cumulative development would not increase the Bay Area ozone concentrations. If the HC emission reduction strategies adopted in the 1982 Bay Area Air Quality Plan are successful, these concentrations are expected to meet the federal standards by 1987.

"NOx emissions would decrease in San Francisco by about 2% from 1984 to 2000 but would increase in the Bay Area by about 5% from 1984-2000. It is possible, that the Bay Area cumulative NOx emissions could increase ozone and/or nitrogenous oxidant concentrations further downwind, outside the Bay Area. In addition, incremental NOx emissions generated by cumulative development throughout the Bay Area (including the project) could increase acid rain further downwind, outside the Bay Area to a relatively small extent, due to the magnitude of the increase and to dilution over time and distance.

"In 1990 and 2000 according to the Downtown Plan EIR area-wide traffic volumes in the downtown area would increase by about 8%, and 15%, respectively, over 1984 volumes. Average traffic speeds would decrease by about one mph and 2 mph, respectively from 1984 speeds. However, in 1990 and 2000, the average vehicle is expected to emit 32% and 43%, respectively, less CO than in 1984 due to ongoing state and federal emissions controls.

"CO concentrations at the 11 intersections in the downtown study area as analyzed in the Downtown Plan EIR would decrease from 1984 to 1990 and thereafter to 2000. CO concentrations at 10 of the 11 intersections would be within the state and federal standards in 1990 and 2000 under the Downtown Plan and the Alternatives. CO concentrations at one intersection would continue to exceed the state and federal eight-hour standards both in 1990 and 2000 under the Downtown Plan and the Alternatives.

"Curbside CO concentrations at the four intersections most affected by project-generated traffic, and by cumulative development traffic (based both on the Downtown Plan EIR growth projections and on the March 10, 1984 cumulative list), were projected for worst-case conditions and are compared with the ambient standards in Table 15, page 102a [page 79 of this supplement]. These projections were calculated using a revised version of the Modified Linear Rollback (MLR) method which was developed for the Downtown Plan EIR.

"The results indicate that both the state and federal eight-hour average CO standards are violated under current conditions at Broadway/Sansome and Broadway/Battery. No other violations of state and federal standards are predicted to occur under existing or future conditions at these locations. CO concentrations would be lower at nearby intersections, including Lombard/Sansome, which are less heavily traveled than those intersections analyzed (Broadway/Battery and Broadway/Sansome). Since CO concentrations drop off rapidly with distance from curbside, occupants of nearby buildings would be exposed to lower concentrations of CO than reported in Table 15. Pedestrians in the project vicinity would be exposed to higher concentrations than would occur without the project, but the increase would be comparable to the range of error in conventional monitoring or modeling. No other sensitive receptors were identified that would be adversely affected by the proposed project.

"The California State Legislature has mandated a biannual inspection and maintenance (I/M) program which applies to most cars and light trucks in California. This program went into operation in March 1984. Vehicles covered by the legislation must undergo a check consisting of a visual inspection of the vehicle's emission control system, measurement of tailpipe emissions while the vehicle is idling and comparison of the measured emissions rate to the allowable limits for the appropriate year of manufacture and model of vehicle. Vehicles must have the required emission control equipment and must meet the specified standards for hydrocarbons and carbon monoxide. If required emissions control equipment is not present it must be installed. If all required equipment is in place but the vehicle's emissions exceed the standards, the owner is required to pay a maximum of $50 for service intended to result in compliance.

"An annual I/M program was evaluated in the 1982 Bay Area Air Quality Plan based on the 1979 source inventory. Based on predicted reduction in hydrocarbons and CO of 25% in covered vehicles, a reduction in total motor-vehicle generated CO of about 18% would be expected. The reduction in total regional CO emissions would be about 16%. The reduction in motor-vehicle generated hydrocarbons would be about 17%; the reduction in total regional hydrocarbon emissions would be about 6%. It can be seen from this data that the I/M program is expected to result in reductions in hydrocarbon and CO emissions.

"Since CO concentrations in downtown San Francisco are almost entirely due to motor vehicles, future CO levels are predicted to be about 18% lower than would have occurred in the absence of the I/M program. Thus, curbside CO concentrations shown in Table 15 and CO and HC emissions shown in Table 14 are expected to be higher than would actually occur.

"Emissions of TSP generated by the project and by cumulative development would increase TSP concentrations, which could increase the frequency of TSP standard violations in San Francisco, with concomitant health effects and reduced visibility.

"Emissions of sulfur oxides (SOx) generated by the project and by cumulative development would probably not bring San Francisco's sulfur dioxide (SO_2) concentrations measurably closer to violating the standard.

"The 1982 Bay Area Air Quality Plan contains strategies which consist primarily of HC and CO emission controls on stationary sources and motor vehicles, and transportation improvements, and are aimed at attaining the federal ozone and CO standards. As discussed above, emissions associated with the project and with cumulative downtown development are not projected by this EIR or by the Downtown Plan EIR to increase ozone concentrations and thus would not conflict with the objectives regarding ozone of the 1982 Bay Area Air Quality Plan. Cumulative downtown development is projected by the Downtown Plan EIR potentially to result in a violation of the 8 hour average CO standard at the Brannan and Sixth Street intersection, analyzed therein. The model used to make the CO projections might not be accurate to within the percentages of the excesses. Therefore, until additional CO 'hotspot' monitoring is performed to validate the model projections, a determination of whether downtown development would conflict with objectives of the 1982 Bay Area Air Quality Plan regarding CO cannot be made.

TABLE 15

EXISTING AND PROJECTED CURBSIDE CARBON MONOXIDE CONCENTRATIONS[1] AT SELECTED INTERSECTIONS

(parts per million)

	Averaging		Cumulative	Downtown Plan[3]	
	Time	1984	List 1990[2]	1990	2000
Broadway/Sansome	1 hour	12.4	9.7	9.6	8.9
	8 hour	9.5	7.3	7.3	6.6
Broadway/Battery	1 hour	13.1	10.1	10.0	9.4
	8 hour	10.3	7.5	7.7	7.1

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[1] Calculations for all scenarios were made using the Modified Linear Rollback Air Quality Model described in the Downtown Plan EIR. Underlined values are in excess of the state or federal CO standards. The one hour state standard is 20 ppm, the one hour federal standard is 35 ppm, and the eight hour state and federal standards are 9 ppm.

[2] Based on the list of projected Cumulative Office Development in Downtown San Francisco as of March 10, 1984, Table F-2, page A-66 [page A-56 of this supplement].

[3] Based on growth projection methodology contained in Downtown Plan EIR, Table IV.I.3., Comments and Responses, page C&R-I.8.

Source: EIP Corporation

"The pollutant emissions and CO concentrations shown in Tables 14 and 15 were projected for 1990 on the basis of two different sets of future growth assumptions, with differing results. In one case, a list of specific projects proposed, approved and under construction was used (the list of Cumulative Office Development in Downtown San Francisco, March 10, 1984). In the other case, the employment growth trend approach of the Downtown Plan EIR was used, and those projections presented. In both cases, the method for the air quality analyses was identical. However, the results using projected cumulative development are not directly comparable with those from the Downtown Plan EIR for several reasons.

"First, it is reasonable to assume that the projected cumulative development on the list would be completed and occupied sometime between 1990 and 2000, rather than in either of those two analysis years used in the Downtown Plan EIR. The pollutant emissions and

CO concentrations were calculated for 1990 using the cumulative list, even though those projects are not expected to be completed until the mid-1990s, in order to provide a comparison with the Downtown Plan EIR results. However, this has the effect of artificially increasing the cumulative list results, because average-vehicle emission rates will decline with time, as a result of federal and state controls.

"Second, the transportation analysis used for the Downtown Plan EIR differs from that used for the cumulative list. Briefly, these differences include the fact that a cumulative list-based analysis assumes that the same proportion of new employees would commute by private auto as is currently the case. In contrast, the Downtown Plan EIR analysis projects that commuters will shift from driving alone to using carpools and transit, because commute routes such as the Bay Bridge are already at or near capacity and could not accommodate all of the vehicles that would be used if the proportion of persons driving alone to work remained constant.

"Other reasons for the differences include the use in the cumulative list analysis of a constant regional distribution of trips, whereas the Downtown Plan EIR forecasts a declining percentage of new employees residing in San Francisco, and the lack in the cumulative list approach of discounting factors to account for trips between individual projects within the Downtown. Also, the cumulative list applies to the entire Downtown area, a larger geographical area than the Downtown Plan EIR, which applies to the C-3 District only.

"Thus, total (regional) vehicle miles traveled and the resulting pollutant emissions projected using the cumulative list approach are considered artificially high. On a local intersection basis, traffic volumes and the resulting CO concentrations might or might not be higher with the cumulative list approach, depending on the particular location. This is because the cumulative list method does not distribute traffic on all the same streets in the same proportions as does the Downtown Plan EIR method. For the two intersections analyzed here, the projected traffic volumes and CO concentrations are higher with the cumulative list approach."

Footnote 4, referred to and found on page 102 of the DEIR, is changed to 1.

F. ENERGY

The following material replaces the text and table on pages 106 through 108 of the DEIR:

"Pacific Gas and Electric Company supplies energy to San Francisco customers. Electrical energy is generated from various sources of energy including oil, gas, hydroelectric, geothermal, nuclear, wind, cogeneration and solid waste.[1] In future years PG&E expects to generate electricity from these sources and from coal. The proportion of energy generated from oil and gas is expected to decrease by 1990 with corresponding increases in the proportion of energy generated from the other sources listed above.[2]

"The site is currently in use as a parking lot. There are no energy consuming structures on the site.

"The project would require about 22 billion BTU of energy for construction in the form of gasoline, diesel fuel, electricity and lubricants. This is the energy equivalent of 3,900 barrels of oil.

"New buildings in San Francisco are required to conform to energy conservation standards specified by Title 24 of the California Admdinistrative Code. The State allows building developers to comply with the standards through the component performance standards method which requires the incorporation of a set of specific design features, through the use of nondepletable energy resources, or by demonstrating that the building would consume no more than a specified quantity of energy, expressed as BTU's per square foot-per year (energy budget).[3] Documentation showing compliance with these standards is submitted with the application for the building permit, and is enforced by the Bureau of Building Inspection.

"At this stage in the project design, there is insufficient information upon which to base a building energy budget analysis for either Title 24 compliance or other engineering purposes. Therefore, estimates of the likely energy consumption of the proposed project have been made based upon comparisons with other recent projects in San Francisco and assuming compliance with Title 24 by the energy budget method.[4] The resulting estimates are shown in Table 16, page 107 [page 82 of this supplement].

TABLE 16

ESTIMATED PROJECT ENERGY USE [1]

Allowable Under Title 24 Energy Budget	
Total annual BTU[2] per square foot of office space	126,000 BTU per square foot per year
Total annual BTU per square foot of retail space	200,000 BTU per square foot per year
Daily Natural Gas Consumption[3]	
Estimated daily natural gas consumption per square foot	40 BTU
Estimated peak daily natural gas consumption[4]	80 therms
Monthly Electric Consumption[5]	
Estimated monthly electric consumption per square foot	1.4 kilowatt hours
Estimated total monthly electric consumption	.2 million kilowatt hours
Annual Consumption	
Estimated total annual natural gas consumption	18,100 therms
Estimated total annual electric consumption	2.3 million kilowatt hours
Connected kilowatt load	800 kilowatts
Estimated total annual energy consumption	25 billion BTU equivalent to 4,500 barrels of oil

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[1] The project would include 139,000 sq.ft. of office space, 3,000 sq.ft. of retail space. Energy use includes space conditioning, service water heating and lighting in accordance with allowable limits under Title 24. Estimated electricity consumed by typewriters, computers, coffeemakers, etc., is included in the projections, although not included in the Title 24 estimates. Transportation energy use appears in a separate table.

[2] BTU (British Thermal Unit): A standard unit for measuring heat. Technically, it is the quantity of heat required to raise the temperature of one pound of water 1° Fahrenheit (251.97 calories) at sea level.

[3] The assumed split between electricity and natural gas for office and retail (90% electricity, 10% natural gas) uses is based upon predicted consumption rates of other San Francisco projects. However, this "split" is sensitive to the design used; actual consumption rates may differ considerably.

The amount of gas that would be consumed is based on unpublished building energy consumption data supplied by David Rubin, Department of City Planning, oral communication, April 1984.

[4] As detailed engineering studies have not been performed for the proposed design, estimates of peak natural gas consumption are highly speculative. A review of load curves prepared for other projects indicates that peak demand may be about 50% greater than average demand. The estimate here is based on that assumption.

[5] The amount of electricity that would actually be used includes non-occupant loads covered by Title 24 as well as electric loads from computers, copiers and typewriters. The total estimated electricity consumption is based on unpublished building energy consumption data supplied by David Rubin, Department of City Planning, personal communication, April 1984.

Note: Energy Conversion Factors:
one gallon gasoline = 125,000 BTU
one kilowatt (kw) = 10,239 BTU assuming operational efficiency of 33% for fossil or nuclear fueled power plant
one therm = 100,000 BTU
one cu.ft. of natural gas = 1,100 BTU at source
one barrel of oil = 5,600,000 BTU

"Daily and annual load distribution curves for the project cannot be estimated at this time because of the lack of detailed design information. As load curves are not governed by Title 24, no reasonable assumptions are readily available. It may be noted, however, that similar projects in San Francisco for which load curves have been developed show peak electrical consumption occurs on hot August or September afternoons (due to demand for cooling), which coincides with PG&E's systemwide peak.[5] Representative load curves for natural gas and electricity consumption in office buildings are shown in Figures 22 and 23, pages 109 and 110. The drop in electrical demand at the noon hour shown in Figure 22 is due to smaller demand for appliance operation and cooling as workers stop for lunch. Natural gas demand of other office projects has been predicted to peak during cold January mornings, which does not coincide with the systemwide peak, which occurs on cold January evenings. The actual load curves for the proposed project would be expected to be similar in shape but different in magnitude of demand from those in Figures 22 and 23.

The project through its proposed mitigation measures to encourage the use of transportation alternatives to the automobile would conform to Objective 4, Policy 1 of the Energy Component of the Environmental Protection Element of the Comprehensive Plan.

"Based on the March 10, 1984 list of cumulative office development in downtown San Francisco, yearly estimated electrical consumption for the projected 19 million square feet of additional office space in downtown San Francisco would be approximately 340 million kWh of power per year (see Appendix F, Table F-2, page A-66 [page A-56 of this supplement] for a list of these projects).[6] Pacific Gas and Electric Company, in examining its ten-year load growth projections for San Francisco, believes that growth rates of net new office space in the downtown area will diminish in the next decade from the historic figure of 1.5 million square feet per year to between 1 million and 1.2 million square feet per year.[7] Total increased energy demand for the next decade would be approximately 200 million kWh of electricity per year, less than projected using the cumulative list.[8] The lower PG&E prediction is largely due to its lower estimation of future development.

"Projections of electrical use for growth that would occur under the Downtown Plan EIR indicate an increase of about 210 million kWh of electricity per year between 1984 and 1990 as a result of all new development occuring in the C-3 District. From the period 1984 to 2000, electrical consumption rates would increase annually by 330 to 350 million kWh above present figures, or 120 million to 140 million kWh per year above the increases estimated for the 1984-1990 period.[9,10] Electric requirements for development that would occur with the alternatives analyzed in the Downtown Plan EIR would increase between 300 million and 500 million kWh per year between 1984 and 2000.[11]

"Natural gas consumption for new office development would be less than current demand, which includes consumption in older, less energy-efficient buildings. Based on growth estimates contained in the Downtown Plan EIR, the Department further estimates that, between 1984 and 2000, gas consumption will grow by 470 million cubic feet (about five million therms), per year of which 210 million cubic feet (about two million therms) per year would be for office uses.[9] Between 1984-2000 natural gas requirements for development that would occur with the alternatives analyzed in the Downtown (about six-nine million therms) per year.[11]

"For two reasons, referenced estimates in the Downtown Plan EIR are not directly comparable to those estimates made by applying energy consumption factors to the square footage of projected cumulative development (list method). First, the list-based energy projections estimate energy demand at the time of full buildout (mid-1990s) rather than during the 1984-1990 and 1990-2000 time periods as in the Downtown Plan EIR. Second, about 75% of the projects on the March 10, 1984 list of projected cumulative development in downtown San Francisco fall within the C-3 District boundary, which means the list method estimates energy consumption for a larger area than the Downtown Plan EIR.

"The PG&E projection cannot be compared to the projections in the Downtown Plan EIR because they cover different time periods. A comparison of the Downtown Plan and PG&E estimates for projected energy demands in downtown San Francisco for 1990-2000 is being prepared by PG&E in a report to be released later this year. PG&E plans to meet increased San Francisco energy demands to the year 2000 are discussed on pages IV.G.13-

14 of the Downtown Plan EIR, which are hereby incorporated by reference. In summary, that material indicates the demand increases in electricity would be met from nuclear sources, oil and gas facilities, hydroelectric and geothermal facilities, and other sources such as cogeneration, wind and imports. PG&E plans to continue receiving most of its natural gas from Canada and Texas under long-term contracts.

"Transportation demand generated by the proposed project would also result in energy consumption. The amounts of electricity, gasoline and diesel fuel which would be consumed by various modes of transit are shown in Table 17. These figures were calculated based on data contained in the Downtown Plan EIR. The total annual transportation energy which would be consumed by the proposed project is 26.5 trillion BTU, the energy equivalent of 4,700 barrels of oil."

TABLE 17

PROJECT RELATED ANNUAL TRANSPORTATION ENERGY CONSUMPTION [1]

	Electricity (kilowatt hours)	Gasoline (millions) (gallons)	Diesel (gallons)	Total BTU (millions)
Auto/Taxi/Jitney/Motorcycle		110,000		15,200
BART	650,000			6,700
Muni Electric	125,000			1,300
Regional Bus Systems			16,000	2,600
SPRR			4,200	700
Project Total	775,000	110,000	20,200	26,500

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[1] The methods used to calculated these figures are described in detail in the Downtown Plan EIR, EE81.3, certified October 18, 1984, Appendix N. The associated data is contained in Table N.6.

The following replace footnote 1 on page 108.

"[1] Pacific Gas and Electric Company, 1981 Annual Report, San Francisco, California, 1982.

"[2] Pacific Gas and Electric Company, 1980 Annual Report, San Francisco, California, 1981.

"[3] State of California Energy Resources Conservation and Development Commission, Conservation Division, Energy Conservation Design Manual for New Nonresidential Buildings, October, 1977.

"[4] Estimated energy use includes space conditioning, service water heating and lighting in accordance with allowable limits under Title 24. Estimated electricity includes an additional 5 kWh/sq ft/yr consumed by appliances such as typewriters, computers, coffeemakers, etc. than assumed by Title 24 estimates.

"[5] Load curves for air-conditioned office buildings in San Francisco tend to be similar across a wide range of building designs. This is because energy consumption rates correlate well with outside temperature and working hours. The load curves shown in Figures 22 and 23, pages 109 and 110, were selected to provide an indication of the shape of the actual load curves, which cannot be calculated until the design work has proceeded further. An example of similar load curves can be found in the Final EIR for the Second Street Square (82.591E), FEIR certified January 12, 1984.

"[6] Energy consumption factors of 18 kWh sq.ft./year and 11 cu.ft./year (about 12100 Btu) are based on unpublished data of actual building consumption rates supplied by David Rubin, Department of City Planning, personal communication, April, 1984 and include base power consumption of the building core (uses covered by Title 24) and power demands of electric office machines (uses not covered by Title 24).

"[7] Ken Austin, Commercial-Industrial Marketing Supervisor, Pacific Gas and Electric Company, letter of March 23, 1984. Available for public review at the Department of City Planning, Office of Environmental Review, 450 McAllister St., 5th Floor, San Francisco.

"[8] PG&E's analysis of a typical office building yielded an annual consumption of about 17 kWh per sq.ft. per year which agrees with the City's estimate within the limits of estimation methodology.

"[9] San Francisco Department of City Planning, Downtown Plan EIR, Vol. I, pages IV.G.1-IV.G.17.

"[10] The Downtown Plan EIR uses a consumption rate factor of 18 kWh/square foot/year from 1984-1990 and 16 kWh/square foot/year from 1990-2000. These different factors are due to Title 24 revisions to reduce building energy budgets. These new standards would be reflected by lower electrical consumption in buildings occupied after constructed by 1990.

"[11] San Francisco Department of City Planning, Downtown Plan EIR, Vol.1, pages VII.G.1-VII.G.4."

G. GROWTH INDUCEMENT

The following material replaces the last two sentences of the last paragraph on page 118 of the DEIR:

"Currently, there are 343,000 gross square feet of office space approved or under construction in the Base of Telegraph Hill area, an additional 235,910 gross square feet under formal review and 54,000 gross square feet recently completed. The project would represent approximately 22% of the cumulative office development in the Base of Telegraph Hill area. (See Section III.A., Table 1, page 24, [page 11 of this supplement].)"

V. MITIGATION

The following replaces the first full paragraph on page 120 of the DEIR:

"Based on the archival research and pretesting at the site, an archaeologist would instruct all excavation and foundation crews on the project site of the potential for discovery of cultural or historic artifacts, and the procedures to be followed if such artifacts are uncovered.

"In the event of high probability of discovery of cultural or historic artifacts, the Environmental Review Officer may require that an archaeologist be present during site excavation and record a daily log of observations. The Environmental Review Officer may also require cooperation of the project sponsor in assisting such further investigations on site as may be appropriate prior to or during project excavation, even if this results in a delay in excavation activities.

"Should cultural or historic artifacts be found during project excavation, the archaeologist would assess the significance of the find, and immediately report to the Environmental Review Officer and the Secretary of the Landmarks Preservation Advisory Board. The Environmental Review Officer would then recommend specific mitigation measures, if necessary, and recommendations would be sent to the State Office of Historic Preservation. Excavation or construction which might damage the discovered cultural resources would be suspended for a maximum of four weeks to permit inspection, recommendation and retrieval, if appropriate. This maximum of four weeks shall include any other time periods for which the Environmental Review Officer has required a delay in excavation activities."

The following text replaces the first two paragraphs under D. Transportation, on page 121 of the DEIR:

"A member of the building management staff would be designated as a "transportation broker" to coordinate measures that are part of a transportation management program, such as: encouraging a flexible time system for employee working hours (to be developed by project tenants in consultation with the Department of City Planning) to reduce peak-period congestion by a planned spreading of employee arrivals and departures; encouraging transit use through the on-site sale of BART, Muni and other carriers' passes to employees; and encouraging employee carpool and vanpool systems in cooperation with RIDES for Bay Area Commuters by providing a central clearinghouse for carpool and vanpool information."

The following text is added to the Transportation mitigation measures following the third complete paragraph on page 122 of the DEIR:

"MITIGATION MEASURES THAT COULD BE IMPLEMENTED BY PUBLIC AGENCIES

"If the City were to adopt and implement the transportation improvements described in the Downtown Plan, cumulative transportation impacts would be reduced within San Francisco and, to the extent that San Francisco could influence transportation improvements recommended in the Plan for areas outside the City, adoption of the Plan would reduce regional cumulative impacts caused by downtown growth. The Downtown Plan was approved by the City Planning Commission on November 29, 1984.

"Should the Downtown Plan not be implemented, the City could act to implement the transportation mitigations described in Section V.E., Mitigation, pages V.E.4-28, in the Downtown Plan EIR. These measures are similar or identical to those in the Downtown Plan and include, in summary: measures to construct and maintain rail rapid transit lines from downtown San Francisco to suburban corridors and major non-downtown centers in

San Francisco; measures to fund Vehicle Acquisition Plans for San Francisco and regional transit agencies to expand existing non-rail transit service; provide exclusive transit lanes on City streets and on freeways; reduce incentives to drive by reducing automobile capacities of bridges and highways in certain circumstances and by discouraging long-term parking; measures to encourage carpools, vanpools, and bicycle use; and measures to improve pedestrian circulation within downtown San Francisco.[2] Some of the Implementing Actions would require approval by decision makers outside the City and County of San Francisco; many of the measures would require action by City agencies other than the City Planning Commission, such as the San Francisco Public Utilities Commission and/or Board of Supervisors. These measures are system-wide measures that must be implemented by public agencies. Other than project-specific measures such as the Transit Impact Development Fee assessment required by San Francisco ordinance 224-81 that contribute indirectly to implementation of these system-wide measures, it is not appropriate or reasonable to impose mitigation at system-wide levels on individual projects."

The following text is added to the Energy mitigation measures following the last sentence of the first paragraph on page 124 of the DEIR:

"The project would be required to meet State Title 24 Energy Standards and thus would not breach state standards for energy consumption. However, in order to provide for possible further reductions in energy consumption, the following additional measure is under consideration by the project sponsor:

> One year after occupancy of the structure, actual energy consumption, converted to thousands of British Thermal Units, from Pacific Gas and Electric monthly billings, shall be reported to the Department of City Planning. If the consumption exceeds applicable state standards in effect at the time of the issuance of the Building Permit, a PG&E or other certified energy audit shall be performed, and those recommended energy conservation measures which have a three-year or shorter payback shall be implemented."

The following footnote is added after footnote 1 on page 125 of the DEIR:

"[2] Department of City Planning, Downtown Plan Environmental Impact Report, 81.3E, FEIR certified October 18, 1984, Section V.E., "Transportation and Circulation," pages V.E. 4-28. This material is hereby incorporated by reference and summarized in the above text."

Footnotes 2 and 3, referred to on page 125 and found on page 126 are renumbered 3 and 4 respectively.

VI. SIGNIFICANT ENVIRONMENTAL EFFECTS THAT CANNOT BE AVOIDED IF THE PROJECT IS IMPLEMENTED

The following text replaces the first paragraph on page 127 of the DEIR:

"The following are expected significant impacts subject to final determination by the City Planning Commission as part of its certification process for this EIR. Chapter VI of the Final EIR will be revised, if necessary, to reflect the Commission's findings.

"This chapter identifies significant cumulative environmental impacts that could not be eliminated or reduced to an insignificant level by mitigation measures included as part of the project, as described in Chapter V, Mitigation.

No project specific significant impacts have been identified. Mitigation measures included as part of the project are described in Chapter V, Mitigation Measures, pages 119 to 126 [pages 90 to 93 of this supplement].

"Cumulative development in greater Downtown San Francisco would have a significant effect on the environment in that it would generate cumulative traffic increases as well as cumulative passenger loadings on Muni, BART and other regional transit carriers. These cumulative transportation impacts could cause violations of total suspended particulate (TSP) and localized carbon monoxide (CO) standards in San Francisco with concomitant health effects and reduced visibility. The proposed project would contribute to these cumulative effects."

The second paragraph on page 127 is revised to read as follows:

"The proposed project's total parking demand would be about 84 spaces. The project would eliminate 269 existing surface spaces and provide 50 underground spaces. The added parking demand would increase surrounding parking occupancy from 79% to 93%, virtually saturating the existing parking supply."

VII. ALTERNATIVES

The following preferred alternative is to be added at the end of page 135 of the DEIR, preceding footnote 1:

"H. ALTERNATIVE EIGHT: REDESIGNED LARGER BUILDING WITH ABOUT 276 PARKING SPACES

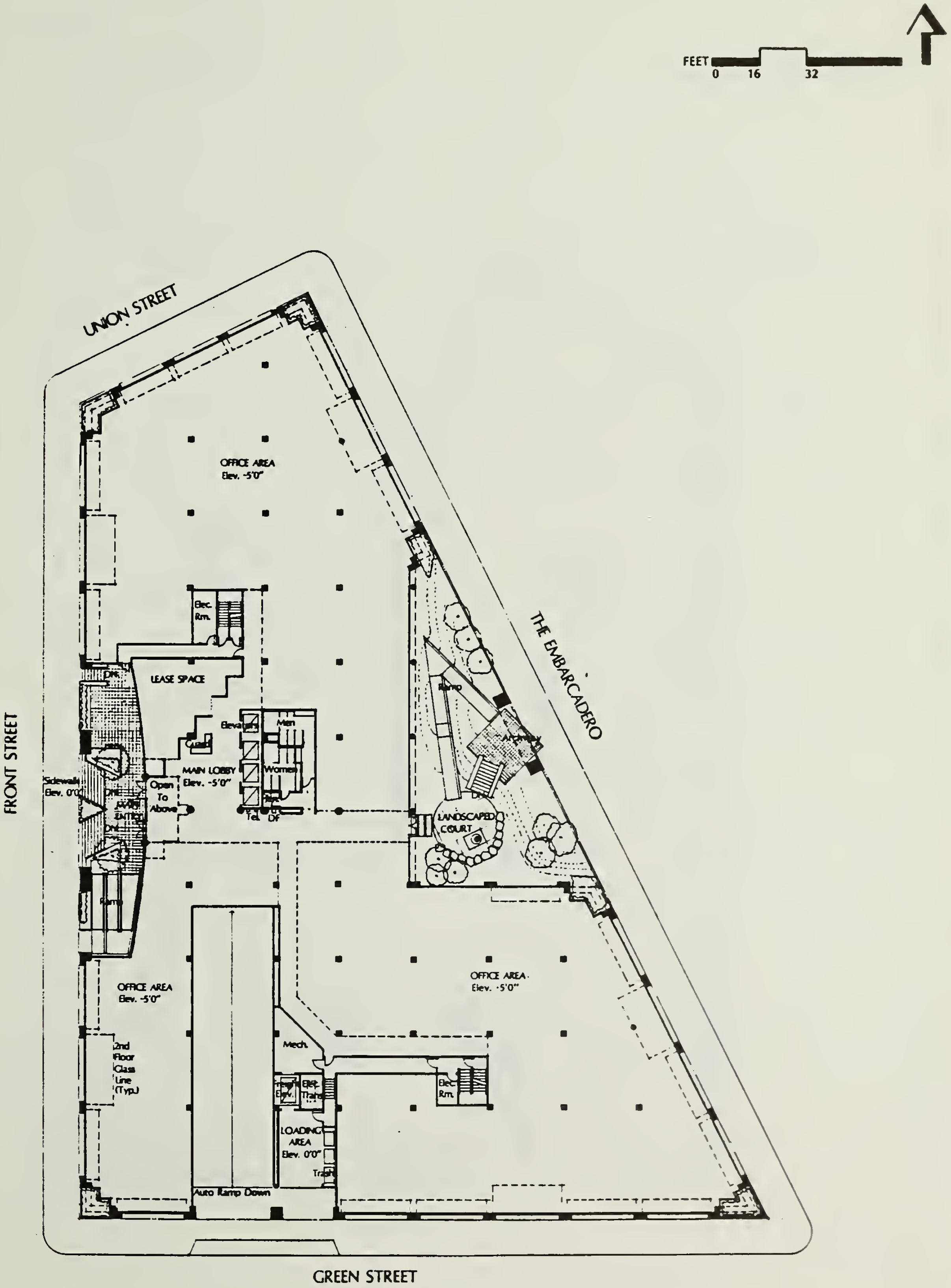
"This alternative would be approximately 4% larger than the proposed project and is intended to provide an improved design in keeping with other structures in the project area within the Northeast Waterfront Historic District and to provide the City Planning Code required number of off-street parking spaces. The alternative would be built to the lot lines except for a setback at the entrance on Front Street, and a landscaped open space on The Embarcadero, compared with the project, which would be set back at the ground level on all sides with a landscaped area on The Embarcadero side (see Figures 24 through 27).

"The alternative would contain 196,105 gross square feet (gsf) of office space (about 7,100 gsf or 4% more than the proposed project), including 147,000 gsf of office space (about 8,000 gsf or 6% more than the proposed project), 3,500 gsf of commercial retail space (about 500 gsf or 17% more than the 3,000 gsf of restaurant space in the proposed project), 45,500 gsf of parking area (about 24,500 gsf or 116% more than the proposed project) and about 5,000 gsf of rooftop mechanical space (about 1,000 gsf or 17% less than the proposed project). About 20,000 gsf of storage space in the proposed project has been redesigned as parking area in this alternative. The building would be built to a height of 40 feet, the same as the proposed project.

ALTERNATIVE EIGHT: GROUND FLOOR PLAN

FIGURE 24

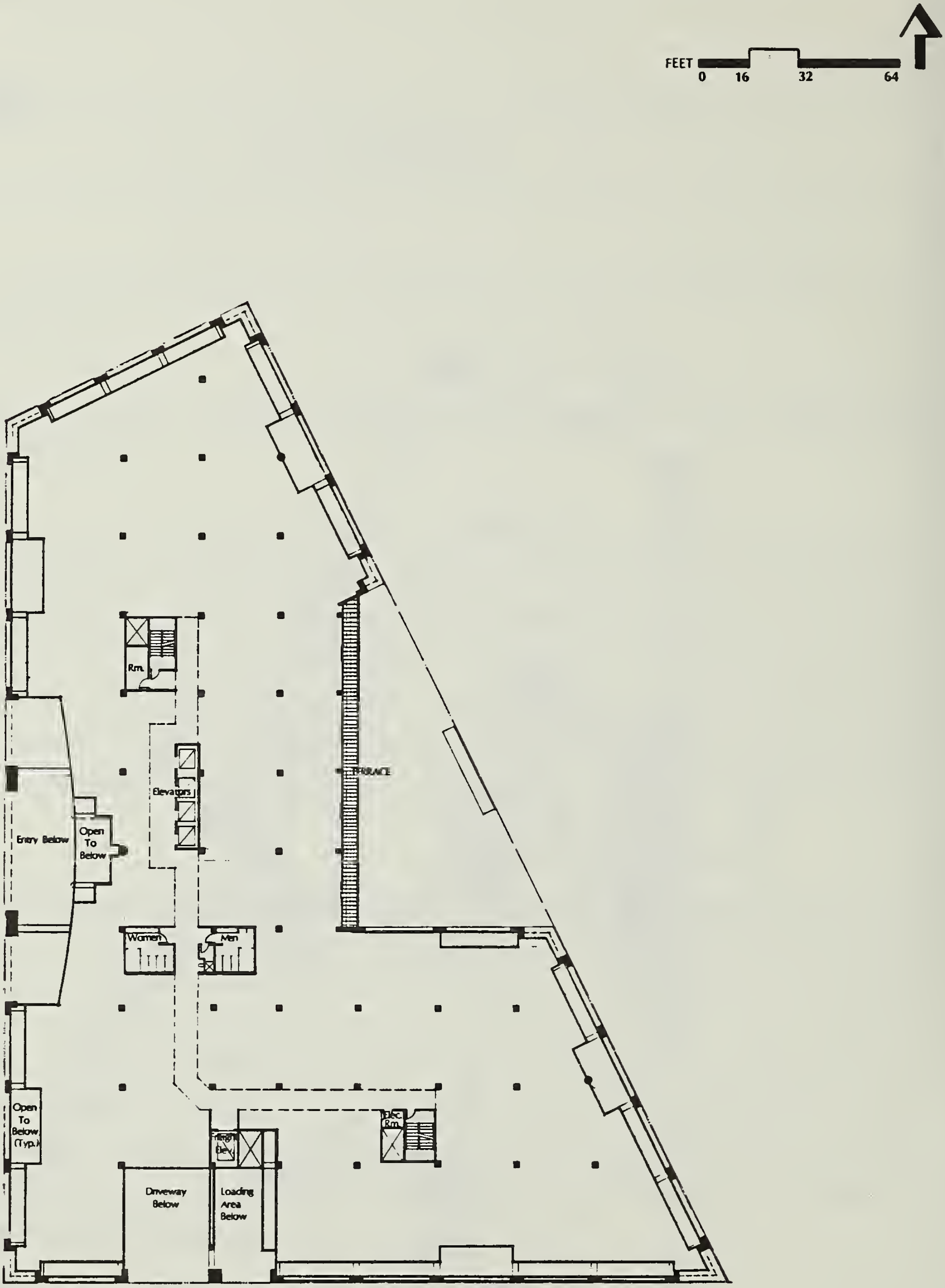
SOURCE: THE MUNSELLE/BROWN PARTNERSHIP INC.



ALTERNATIVE EIGHT: SECOND FLOOR PLAN

FIGURE 25

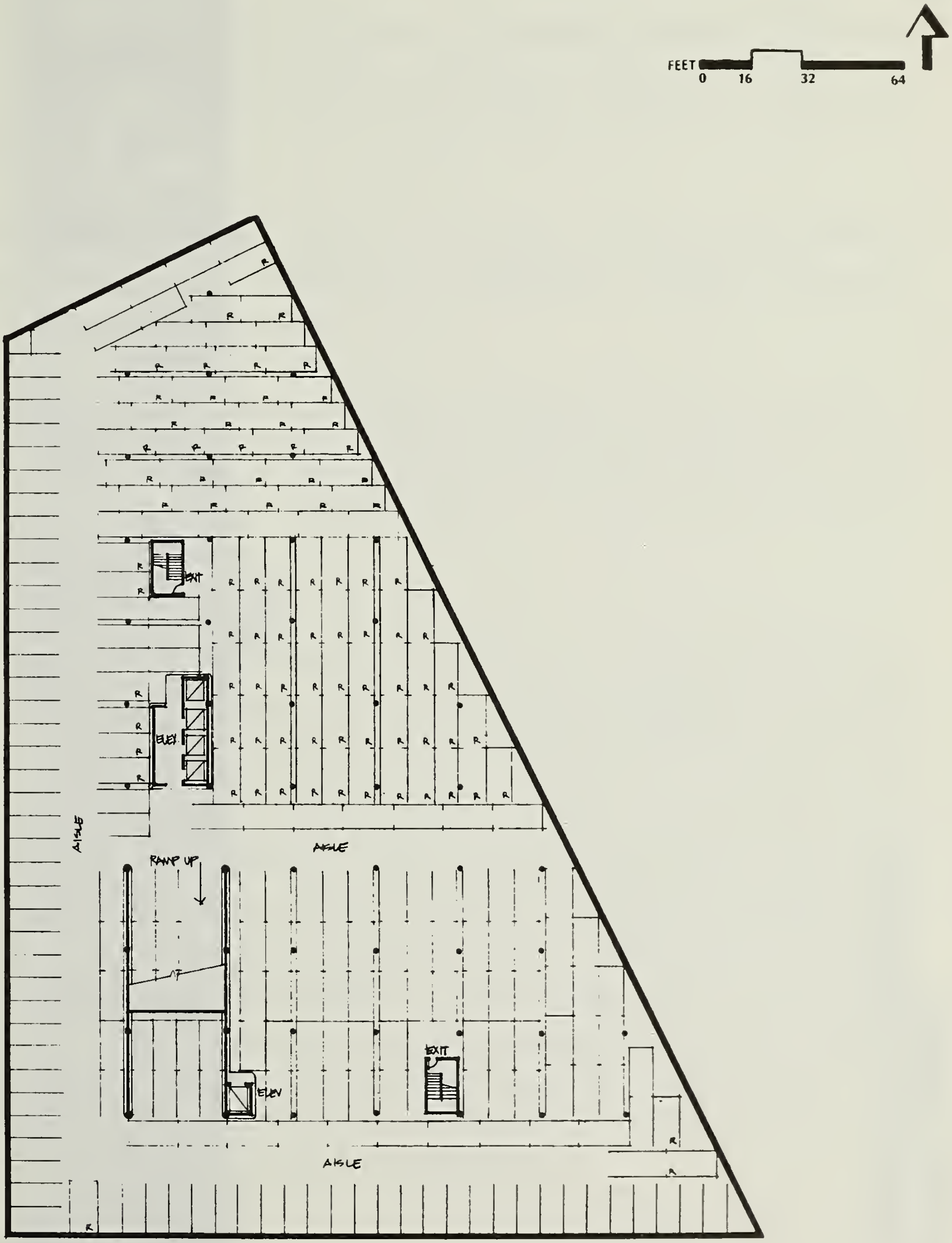
SOURCE: THE MUNSELLE/BROWN PARTNERSHIP INC.



ALTERNATIVE EIGHT: PARKING PLAN

FIGURE 26

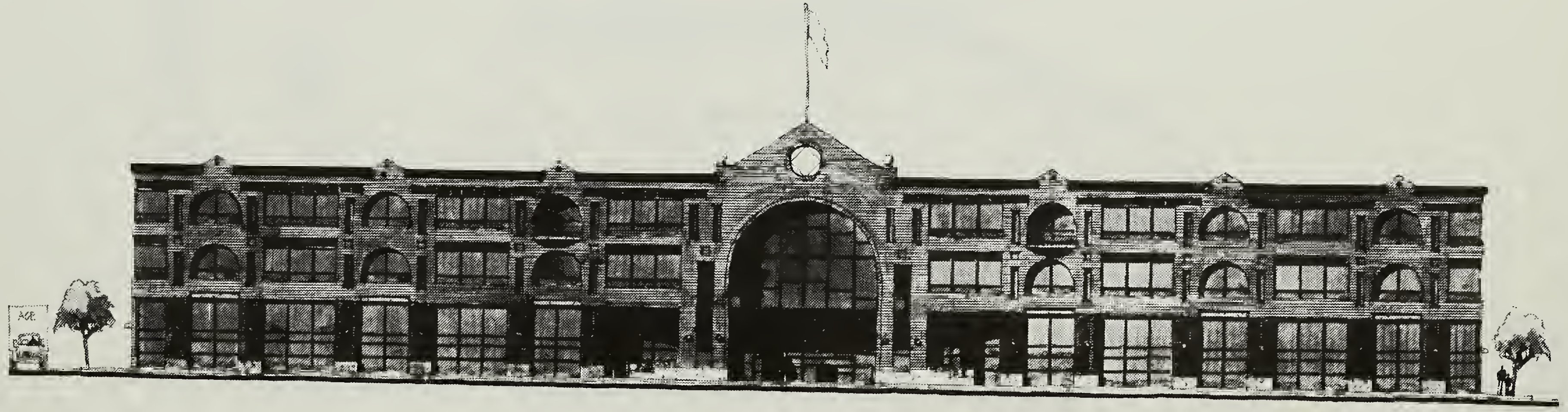
SOURCE: THE MUNSELLE/BROWN PARTNERSHIP INC



ALTERNATIVE EIGHT: FRONT STREET ELEVATION

FIGURE 27

SOURCE: THE MUNSELLE BROWN PARTNERSHIP INC.



"As with the proposed project, the main entrance to the building would be on Front Street and access for the below-grade parking garage would be on Green Street. The parking garage would provide space for about 130 independently accessible spaces or 276 attendant parking spaces.

"Facade materials for the alternative would be of red brick, with clear glass windows on the ground level and bronze glass on upper levels. Balconies on the upper floors would overlook the adjacent streets and the Bay.

"The project sponsor has applied for a conditional use permit to develop the site as a Planned Unit Development and for 276 attendant (tandem) parking spaces (The City Planning Code would require 276 parking spaces for this alternative), instead of independently accessible spaces.

"Land Use and Zoning

"As with the proposed project, the alternative would cause an intensification of land uses on the site. The project, in conjunction with other recently constructed and approved projects in the Base of Telegraph Hill area, would contribute to a change in intensity and type of land uses from low-rise, warehouse-type structures to new mid-rise office buildings, such as Levi's Plaza. Like the proposed projects, this alternative would respond to Base of Telegraph Hill area Objective 3, Policy 1, Urban Design, Policy 13 and 17 and Glass, Policy 28 of the Northeastern Waterfront Plan which encourage the development of uses which would strenthen the areas predominant uses of professional and general offices; provide landscaped areas; and prohibit the use of reflective glass. By increasing the number of parking spaces on the project site and increasing the amount of the space in the project, the alternative, like the proposed project, would not respond to Objective 3, Policy 5 of the Northeastern Waterfront Plan to minimize the intensity of automobile activity and strictly limit parking developed with new uses.

"Visual Quality and Urban Design

"The alternative would relate to the Urban Design Element of the Comprehensive Plan, City Pattern Policy 1 (which protects major City views) in the same manner as the project and Policy 3 (which recognizes that buildings, when seen together, produce a total effect that characterizes the City and its districts) to a greater extent than the project, due to the redesign. Where the proposed project would relate to City Pattern Policies 4 and 5 which encourage landscaping, by including landscaped open space and a garden court along The Embarcadero, intended to be similar to landscaping at Levi's Plaza, the alternative would not include the project setbacks but would continue to include a garden court on The Embarcadero. The alternative would more closely relate than the proposed project to City Pattern Policy 6 and Major New Development Policy 1, both of which encourage harmony in design between new and older buildings. The alternative would be built to the lot lines, without the lower level setbacks in the proposed project, and would include red brick facade material, similar to older warehouse buildings and other newer buildings in the project area, compared with the brick red ceramic tile included in the proposed project.

"The alternative would relate to Major New Development Policies 2, 5 and 6 which encourage relationship of new buildings to existing buildings in terms of design, and scale and Neighborhood Environment Policies 12, 13 and 14 which encourage the inclusion of landscaping and other features of interest and the removal of cluttering elements, such as exposed parking lots, in a similar manner as the proposed project.

"The alternative would be similar to the proposed project in its relationship to objectives and policies of the Northeastern Waterfront Plan with regards to Compatibility of Development, Building Height and Views, and Rooftop Mechanical Equipment.

"The alternative would include continuous street tree planting and a garden court along The Embarcadero although it would not include the same amount of street level open space as the proposed project.

"Historical and Cultural

"The alternative would require the same amount of excavation as the proposed project, and thus, the potential for disturbance of buried historic and cultural artifacts would be the same as with the proposed project.

"Employment, Housing and Fiscal

"The alternative, when fully occupied, would provide 620 permanent jobs for office, retail and janitorial/service functions, including 611 net new permanent jobs, and would create 653 additional Bay Area jobs through the multiplier effect. The alternative would generate 39 more direct jobs and 35 more jobs through other sectors of the Bay Area economy than the project.[3,4]

"Construction activities are expected to take about 18 months and, based on construction costs that would be greater than the proposed project, would generate 200 direct and 310 indirect construction jobs.[5]

"This alternative would generate a demand for 131 housing units, 7 more than the proposed project under the City Planning Commission's Office Housing Production Program (OHPP).[6] Cumulatively, the additional office space included in the alternative would constitute a 0.8% increase, compared with 0.7% for the proposed project, over the 19.0 million square feet of net new office space currently under construction, approved, under formal review or built but not occupied in the greater downtown area. (See Appendix F, pages A-61 to A-70A [pages A-51 to A-61 of this supplement].

"This alternative would generally contribute more to the cumulative impacts of office development than would the proposed project, in proportion to the increased office space.

"Transportation

"Project Travel. This alternative would result in a net increase of 3,187 daily person trips (compared to 2,966 for the project) and 293 p.m. peak-hour outbound person trips, (251 for the project) increases of about 7% in daily travel and p.m. peak-hour travel as compared to the proposed project.

"Traffic. The alternative would generate about 51 peak-hour vehicles, 9% more than the proposed project. As with the proposed project, traffic increases at nearby intersections generated by the alternative would not be measurable within typical daily traffic fluctuations. Similarly increases in freeway volumes would not be perceptibly different than for the proposed project.

"Transit Service. Projected future Muni ridership due to cumulative development would increase about 0.1-0.2% under this alternative, the same as for the proposed project. Peak-hour ridership on other regional transit services would be about 7% higher than for the proposed project or about 0.1-0.2% of expected cumulative development.

"Parking. The alternative would result in a net new parking demand of 90 spaces, 6 spaces more than the proposed project.

"This alternative would include approximately 130 independently accessible parking spaces, a total of 276 on-site parking spaces with proposed attendant parking, or 226 more than the proposed project. The increased number of parking spaces would be due to a redesign of the basement level to be used exclusively for parking (rather than one-half of the basement for storage).

"There would be a net increase in on-site parking spaces of 7 spaces for this alternative compared to a 219 space deficit for the proposed project. Area parking supply (within public off-street parking garages and lots) be about 0.3% higher with the alternative compared to a decrease of 11% with the proposed project. Occupancy in public off-street parking garages and lots would increase from 79% to 83% with this alternative, as compared to an increase from 78% to 93%, with the proposed project.

"The alternative would generate a demand for one off-street loading space and would provide one space in the same configuration as the project.

"Pedestrian Flows. Peak-hour pedestrian flows generated by the alternative would increase proportionately with the 7% increase in overall travel. Pedestrian flows on Front and Battery Streets would remain in the "open" range except for peak five-minute periods when they would worsen slightly to "unimpeded," as would be the case in the proposed project.

"Construction. The alternative's construction-related transportation impacts would not be measurably different than those predicted for the proposed project.

Air Quality

"Local Carbon Monoxide (CO) Impacts. Although motor vehicle traffic generated by the alternative would be more than in the proposed project, the increase would not be large enough to produce a measureable difference between the CO concentrations predicted for the proposed project and those for this alternative.

"Regional Air Quality. Emissions of NOx and HC generated by this alternative would be 7% more than in the amounts shown in Table 14, page 100, [page 75 of this Supplement] for proposed project. This would not produce an increase in ozone concentration that would be large enough to accurately measure or model. As in the proposed project, in conjunction with other projects, project-generated emissions could contribute to measurable cumulative increases in downwind ozone.

"The alternative, like the proposed project, would be consistent with the growth projections and transportation control measures contained in the Bay Area Air Quality Plan.

"Construction Noise

"The levels of noise generated by individual construction activities, such as foundation construction, including pile driving and building erection, would be about the same as the proposed project.

"Energy

"Construction of this alternative would require about the same amount of energy in the form of gasoline, electricity and diesel fuel as the proposed project.

"Estimates of the likely energy consumption of this alternative have been made based upon comparisons with other projects in San Francisco and assuming compliance with Title

24, by the energy budget method. The methodology for projection of energy impacts has changed since the analysis of the proposed project included in the Embarcadero Terraces DEIR. The energy analysis of this alternative incorporates estimates of energy consumption by office appliances, such as typewriters, copying equipment and computers, and thus predicts higher energy consumption per square foot than does the previous analysis. Additionally, the distribution of energy consumption between electricity and natural gas has changed somewhat, with the newer projection method allocating a greater portion of total energy usage to electricity than previously estimated. However, since the alternative would be larger than the proposed project by about 10,000 square feet of office space, the predominant use in the building, energy consumption for the alternative would be proportionately larger than for the proposed project (see Table 18). Calculations for this alternative thus represent a worst-case. Impacts of the proposed project would be approximately 7% less.

"Geology, Hydrology and Seismicity

"The project site would include the same excavation as the proposed project. This alternative, like the proposed project, would include pile driving.

"Status of the Alternative

"This alternative is preferred by the project sponsor. The alternative incorporates changes to the proposed project in an attempt by the project sponsor to reduce the parking impacts of the project described in Section IV, pages 98j to 98n [pages 65 to 70 of this supplement]. In addition, the alternative incorporates design changes made in response to suggestions by the San Francisco City Planning Department staff and the Foundation for San Francisco's Architectural Heritage, intended to make the building more compatible with the Northeast Waterfront Historic District.

TABLE 18

ESTIMATED PROJECT ENERGY USE [1]

Allowable Under Title 24 Energy Budget	Alternative Eight
Total annual BTU[2] per square foot of office space	126,000 BTU per square foot per year
Total annual BTU per square foot of retail space	200,000 BTU per square foot per year
Daily Natural Gas Consumption[3]	
Estimated daily natural gas consumption per square foot	40 BTU
Estimated peak daily natural gas consumption[4]	80 therms
Monthly Electric Consumption[5]	
Estimated monthly electric consumption per square foot	1.4 kilowatt hours
Estimated total monthly electric consumption	.2 million kilowatt hours
Annual Consumption	
Estimated total annual natural gas consumption	19,200 therms
Estimated total annual electric consumption	2.4 million kilowatt hours
Connected kilowatt load	900 kilowatts
Estimated total annual energy consumption	27 billion BTU equivalent to 4,800 barrels of oil

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*The following new footnotes are added to the DEIR after footnote #2 on page 136.

[1] The project would include 147,000 sq.ft. of office space, 3,500 sq.ft. of retail space. Energy use includes space conditioning, service water heating and lighting in accordance with allowable limits under Title 24. Estimated electricity consumed by typewriters, computers, coffeemakers, etc., is included in the projections, although not included in the Title 24 estimates. Transportation energy use appears in a separate table.

TABLE 18

(continued)

[2] BTU (British Thermal Unit): A standard unit for measuring heat. Technically, it is the quantity of heat required to raise the temperature of one pound of water 1° Fahrenheit (251.97 calories) at sea level.

[3] The amount of electricity that would actually be used includes non-occupant loads required by Title 24 as well as electric loads from appliances such as computers, copiers and typewriters. The total estimated electricity consumption is based on unpublished building energy consumption data supplied by David Rubin, Department of City Planning, personal communication, April 1984.

[4] The assumed split between electricity and natural gas (90% electricity, 10% natural gas) use is based upon predicted consumption rates of other San Francisco projects. However, this "split" is sensitive to the design used; actual consumption rates may differ considerably.

Note: Energy Conversion Factors:
one gallon gasoline = 125,000 BTU
one kilowatt (kw) = 10,200 BTU assuming operational efficiency of 33% for fossil or nuclear fueled power plant
one therm = 100,000 BTU
one barrel of oil = 5,600,000 BTU

[5] The amount of gas that would be consumed is based on unpublished building energy consumption data suplied by David Rubin, Department of City Planning, personal communication, April 1984.

[6] Since detailed engineering studies have not been performed for the proposed design, estimates of peak natural gas consumption are highly speculative. A review of load curves prepared for other projects indicates that peak demand may be about 50% greater than average demand. The estimate here is based on that assumption.

"[3] Office employment derived from Guidelines for Environmental Review: Transportation Impacts, Department of City Planning, September 1983, page 14. Retail and maintenance employment derived from analysis in 101 Montgomery Street, FEIR, certified May 7, 1981, page 77.

"[4] Indirect employment projections are based on the Bay Area Input-Output Model from Cooperative Extension Service, University of California, Berkeley, San Francisco Bay Area Input-Output Model 1967-1974., July 1978. A multiplier of 1.18 was used for FIRE and 1.55 for construction.

"[5] An estimated $14,100,000 (1983 dollars) would be spent during construction. The employment estimate assumes labor costs would be about 55% of the total ($14,100,000 x 55% = $7,755,000, including direct wages, payroll taxes and fringe benefits, and annual cost of $36,400 per construction worker.

"[6] San Francisco Department of City Planning, Guidelines for Administering the Housing Requirements Placed on Office Development Under OHPP, January, 1982, page 5.

$$\frac{\text{147,000 gsf of net new office}}{\text{250 square feet per employee}} \times 40\% \div 1.8 = 131 \text{ housing units.}$$

40% = percent of San Francisco workers who live in the City
1.8 = workers per household"

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APPENDIX B

The following material replaces Appendix B, pages A-21 through A-45 of the DEIR.

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Mr. Michael Blumenthal, President
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25 October 1984

Dear Mr. Blumenthal:

The following pages contain the results of a program of archaeological research conducted, under my supervision, within the confines of the proposed Embarcadero Terraces development project, along the San Francisco waterfront. The project site, formally known as Seawall Lot 321, consists of an entire, rhomboidal-shaped, city block, which is currently covered by a paved parking lot. It is bounded on the east by the Embarcadero, on the west by Front Street, and on the north and south by Union and Green streets, respectively (see Figure 1, below).

The purpose of the present research was specifically focused: 1) to determine whether the remains of one or more wooden, nineteenth century sailing ships lay buried in landfill beneath the surface of the ground within the confines of the project site; and, if such cultural remains could be identified 2) to define their location, depth, orientation, age and structural characteristics to the greatest extent possible. To accomplish this goal, a series of fourteen (14) mechanical borings were systematically placed within the project area, and all of the cultural materials derived from these probes were subjected to intensive analysis and interpretation.

BACKGROUND

Before proceeding with the findings of the present archaeological program, some background information is in order. The present study is a direct outgrowth of an earlier program of archaeological research at Embarcadero Terraces, conducted under my supervision in June, 1982. These preliminary research efforts consisted of a detailed review of available archival sources relating to the history and development of the San Francisco waterfront, as well as the placement of twelve (12) mechanical test borings within the Embarcadero Terraces project site. The results of this initial archaeological investigation were submitted in the form of a written report to Mr. Stu During of Environmental Impact Planning Corporation on 8 July, 1982.

Since the above mentioned preliminary report is readily available, there is no need for detailed reiteration of its findings here. However, for the sake of understanding the goals and methods of the present research program at Embarcadero Terraces, a few synoptic comments are in order. Archival research revealed that a number of Gold Rush era ships were reported to have been buried in landfill in the immediate vicinity of the present ptoject site. One ship in particular-- the storeship Phillip Hone-- was believed to lie near the western perimeter of the Embarcadero Terraces project area (see, for example, Olmsted et al 1977:457, Pastron 1982:2-4). While the evidence was ambiguous and at times contradictory, there seemed a reasonable possibility that all or part of the Phillip Hone existed at some point beneath the ground surface within the boundaries of the Embarcadero Terraces project site.

Based upon this possibility, a series of twelve (12) mechanical test borings were placed within the western half of the project site. The specific locations of these preliminary test borings can be seen below in Figure 1. As with the archival research, efforts to locate the remains of the Phillip Hone with mechanical test probes proved to be inconclusive. While some oak was encountered in three contiguous borings (7, 8 and 9) placed on a north-south axis, the probes did not yield sufficient quantities of hardwood to signal the definite presence of a buried hulk. Yet, the presence of oak at what appeared to be the interface of landfill and underlying bay mud was tantalizing. Of possibly greater significance, was the recovery of a hand-hewn, cylindrical wooden dowel from the 8-10 foot level of Boring 7. This hardwood dowel appeared to be a trunnel, or "tree-nail", a common nineteenth century maritime artifact used to fasten a ship's oaken hull plates to the ribs or other structural members. While the presence of a trunnel could not be taken as proof-positive that a buried ship had been encountered, it was noted that all three of the Gold Rush hulks in San Francisco previously investigated by the author had been directly associated with hardwood trunnels.

In conclusion, the evidence, while by no means definitive, appeared strong enough to warrant further testing. Hence, the above mentioned report of 8 July, 1982, recommended that an additional series of mechanical test borings be placed within the western half of the Embarcadero Terraces project area to specifically determine whether or not a buried Gold Rush hulk was situated there. This, then, is the background of the present archaeological testing program.

ARCHAEOLOGICAL TESTING AT EMBARCADERO TERRACES, OCTOBER, 1984

On 6-7 October, 1984, I directed the placement of fourteen (14) mechanical test borings at Embarcadero Terraces. The borings were systematically placed to detect the presence of any wooden hulk buried beneath the ground surface. Before the testing began, a series of imaginary grids were laid out over the entire project area. The design of the grid was as follows: grid lines were laid out at 20 foot intervals on a north-south axis. The size of the hulks likely to be encountered within Embarcadero Terraces was the essential factor that determined the dimensions of the grid units employed in the archaeological testing program. Historical research indicated that vessels of brig, brigantine size or the bark class might lie buried beneath the ground surface of the project area. Such ships, weighing between 200 and 500 tons, would generally exceed 100 feet in length, while the beam, at the widest point, would measure between 25 and 30 feet. Therefore, based upon these measurements, the use of a 20 foot grid sequence would make it impossible to straddle or "leap-frog" a ship hulk during the archaeological testing program. Based upon an analysis of existing archival evidence, the testing grid was laid out so that at least one boring would strike the targeted vessel regardless of its orientation beneath the ground surface. Since the strongest evidence for the presence of a buried ship had come from Boring 7 in the initial archaeological testing program, the bulk of the probes placed during the present research were concentrated within the southwestern quadrant of the Embarcadero Terraces project area. The locations of the fourteen (14) test probes placed within the project site in connection with the present research can be seen in Figure 2, below.

Each boring was excavated with a 24 inch auger, mounted on the back of a diesel powered drilling rig. The methodology employed in the testing program was as follows. The auger proceeded downward in arbitrary levels of two feet. Each boring was excavated to a minimum depth of 25 feet, well below the level of historic fill. With every two feet of downward progress, the auger was removed from the steadily deepening hole, and all of the excavated dirt was carefully examined by Dr. Allen G. Pastron the Principal Investigator. All of the cultural materials encountered in each boring were inspected and logged, and all potentially diagnostic or chronologically sensitive specimens were collected, labelled and bagged for later laboratory analysis. Detailed notes were taken with regard to the nature and composition of subsurface deposits existing within the Embarcadero Terraces project area. These findings are summarized below in the form of individual boring logs. While Dr. Pastron cannot claim professional expertise in the field of geology, the information tabulated in the appended boring logs presents a relatively accurate portrayal, in layman's terms, of the character of subsurface deposits within those portions of Embarcadero Terraces project area subject to examination.

Previous archaeological research along the San Francisco waterfront has allowed Dr. Pastron to establish a series of predictive criteria that are useful in determining whether a mechanical test boring has intersected the remains of a wooden sailing vessel. At Levi's Plaza, only three blocks to the northwest of Embarcadero Terraces, four such criteria were set forth: 1) positive identification of the types of wood-- generally oak or other hardwoods-- commonly used in the construction of nineteenth century ships; 2) retrieval of sufficient quantities of such wood to suggest the presence of a buried ship; 3) an appropriate stratigraphic relationship between the wood and surrounding landfill and the original bay bottom; 4) the recovery of other corroborating evidence suggestive of the presence of a buried hulk. This category might include ballast stone or metal ship fittings (see Pastron and Prichett 1979:15). The identification of one of these diagnostic indicators would signal the possible discovery of a buried wooden ship. If all of these elements were positively identified, the presence of a buried hulk within the project area would be all but certain.

With this methodological preface in mind, we shall now turn our attention to the findings of the 1984 archaeological testing program at Embarcadero Terraces. Cultural materials were encountered in each of the fourteen (14) test borings placed within the project site. For the most part, these cultural objects consisted of typical items of San Francisc landfill refuse-- broken ceramic ware, window and bottle glass fragments, corroded metal, bone, leather, organic debris, brick and other construction rubble. The archaeological materials were not found to be evenly distributed throughout the project site: of the total of 868 cultural items recovered at Embarcadero Terraces during the recent archaeological testing (brick fragments were not included in this count), more than half of the total sample-- 448 objects-- came from only four borings, numbers 19, 20, 21 and 22. The other ten borings yielded only scattered, often isolated, cultural specimens. This was particularly true of the most westerly six borings-- numbers 13, 14, 15, 16, 17 and 18-- placed closest to the line of Front Street. These six probes proved to be almost devoid of cultural materials. Throughout the archaeological testing program, no evidence whatever was unearthed to suggest that foundations or other subterranean architectural remains existed within the confines of the subject parcel.

Since the express purpose of the present archaeological research was to determine whether or not the hulk of a nineteenth century ship lay beneath the ground surface of the project site,special attential was paid to all samples of wood encountered by the auger. In all, a total of 98 wood samples were collected for later identification and analysis Of these, 67 samples were derived from Borings 19, 20, 21 and 22. The 12-14 foot level of Boring 20 produced the greatest volume of wood, almost four kilos. The most tantalizing samples of wood consisted of five hand-hewn, cylindrical, wooden dowels recovered during the course of the testing program. Two of these wooden dowels were recovered from Boring 20, in the 8-10 foot level and the 12-14 foot level, respectively; another two specimens came from the 12-14 foot level of Boring 25; the final wooden dowel was encountered in the 10-12 foot level of Boring 26. These five specimens were of interest because at first glance they resembled the postulated hardwood trunnel recovered from the 8-10 foot level of Boring 7, recovered during the 1982 archaeological testing program at Embarcadero Terraces.

All of the wood collected at Embarcadero Terraces was carefully placed in labelled bags and transported to Archeo-Tec's laboratory in Oakland, California. Once there, each sample was washed, weighed and analyzed. Once these specimens were examined in the laboratory, it became increasingly clear that the remains of a nineteenth century wooden ship had not been encountered within the confines of the Embarcadero Terraces subject parcel. For one thing, almost all of the recovered wood consisted of softwood, primarily pine or fir. As noted above, significant quantities of hardwood, usually oak, are associated with the remains of a buried hulk. Second, none of the wood recovered at Embarcadero Terraces was collected in sufficient quantities to signal the presence of a buried ship. For example, as noted above, Boring 20 yielded the greatest quantity of wood at Embarcadero Terraces, an amount less than four kilos. By contrast, a single test boring at

Levi's Plaza that struck a buried ship hulk brought more than 43 kilos of oak to the surface of the ground (Pastron and Prichett 1979: 127). Third, given the use of the 20-foot grid system at Embarcadero Terraces, a buried ship would have yielded significant quantities of wood at about the same stratigraphic level from at least two contiguous borings. This pattern simply did not occur during the present program of archaeological testing. Rather, the wood that was encountered seemed to be relatively randomly, and generally thinly, scattered within the general area of Borings 19, 20, 21 and 22. Fourth, none of the wood samples recovered at Embarcadero Terraces could be in any way shown to be associated with maritime use. For example, Mr. Harlan Soeten, the retired curator of the San Francisco Maritime Museum, carefully examined the wood recovered at Embarcadero Terraces, particularly the five hand-shaped, cylindrical wooden dowels that at first glance seemed to resemble maritime trunnels. After a careful examination, he concluded that none of these wooden dowels were legitimate maritime trunnels. For one thing, all of these specimens were made of softwood, and genuine trunnels were always fashioned from hardwood, usually locust, but sometimes oak. The remaining wood specimens proved to be equally disappointing. Upon examination, Mr. Soeten concurred with the present author that none of the wood recovered from Embarcadero Terraces during the 1984 testing program could be even tentatively associated with the remains of a buried ship. While it is true that some oak was recovered during the 1984 testing, the quantities of this material were insufficient, and the various samples too randomly scattered around the site, to justify any reasonable interpretation in favor of the presence of a buried ship hulk. Finally, it must be noted that none of the non-wood archaeological specimens recovered during the 1984 testing program could in any way be linked with the remains of a buried hulk on the property.

In conclusion, all of the evidence collected during the recent program of archaeological testing at Embarcadero Terraces seemed to point to a negative finding regarding the possible presence of the buried remains of a nineteenth century wooden sailing ship existing within the confines of the present subject parcel.

With regard to other types of cultural materials recovered during the recent archaeological research at Embarcadero Terraces, nothing was found that seems to meet the criteria of significance for potential inclusion within the National Register of Historic Places. As noted above, most of the archaeological specimens encountered within the subject parcel are fairly typical of San Francisco Bay landfill debris. While some clustering of cultural materials could be noted in the vicinity of Borings 19, 20, 21 and 22, the site does not appear to contain any great concentrations of archaeological materials. Based upon an examination of the recovered cultural items, it would appear that most of the filling at Embarcadero Terraces took place between around 1870 and the beginning of the twentieth century.

CONCLUSIONS AND RECOMMENDATIONS

Taken together, the results of the 1982 and 1984 archaeological testing programs at Embarcadero Terraces point toward the conclusion that a buried ship hulk does not exist within the confines of the subject parcel. Similarly, no other archaeological resources of demonstrable significance have been detected or identified within the project area. Given these determinations, the author has concluded that the commencement of construction work at Embarcadero Terraces will result in no adverse impacts to any cultural resources eligible for inclusion within the National Register of Historic Place. Therefore, no additional preconstruction testing procedures are recommended for the project area with regard to cultural resources. Monitoring of construction activity within the subject parcel should conform to the requirements of the San Francisco Office of Environmental Review.

Allow me to conclude this report on a cautionary note. Although the 1982 and 1984 archaeological testing programs at Embarcadero Terraces have allowed the author to develop a relatively detailed portrayal of the history of the project site, it must be kept in mind that subsursace evaluation has only sampled a small percentage of the total area within the subject parcel. It is easily conceivable that potentially significant cultural resources exist undetected at some location on the property. Given this, should any archaeological resources of potential significance be unearthed during the course of construction at Embarcadero Terraces, the Project Sponsor shall assume the responsibility of insuring that all work within the zone of impact cease immediately and until a qualified archaeological consultant has been retained to examine the findings, evaluate their significance and propose recommendations for the further study and/or mitigation of adverse impacts to the cultural resources which have been encountered.

I hope that these remarks are of help to you with regard to your work at Embarcadero Terraces. If I can add anything else, either now or in the future, please do not hesitate to let me know.

Sincerely Yours,

Allen G. Pastron

Allen G. Pastron Ph.D
President, Archeo-Tec

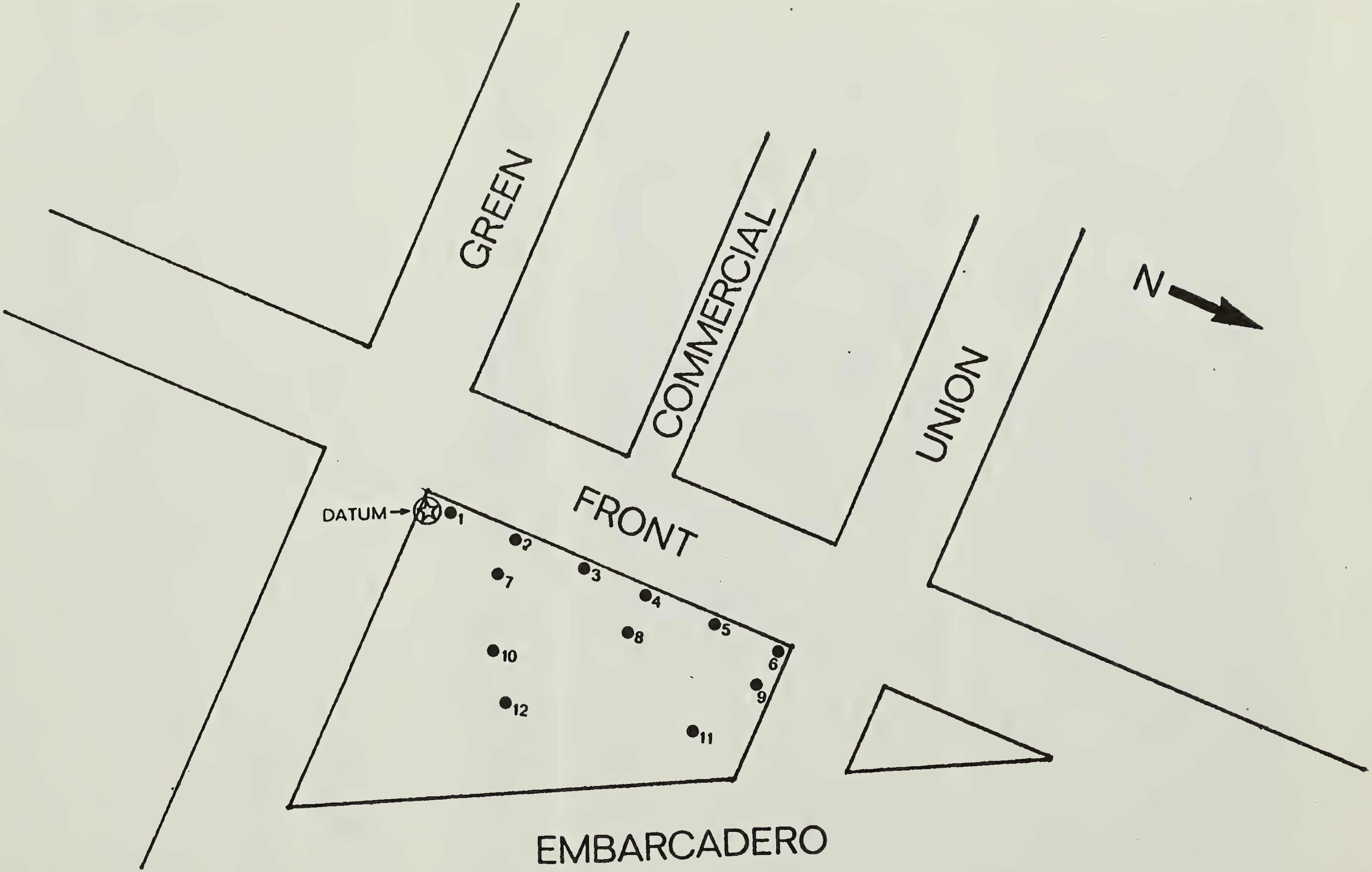


FIGURE 1: EMBARCADERO TERRACES
SITE LOCATION MAP AND PLACEMENT OF ARCHAEOLOGICAL
BORINGS, 1982 TESTING PROGRAM

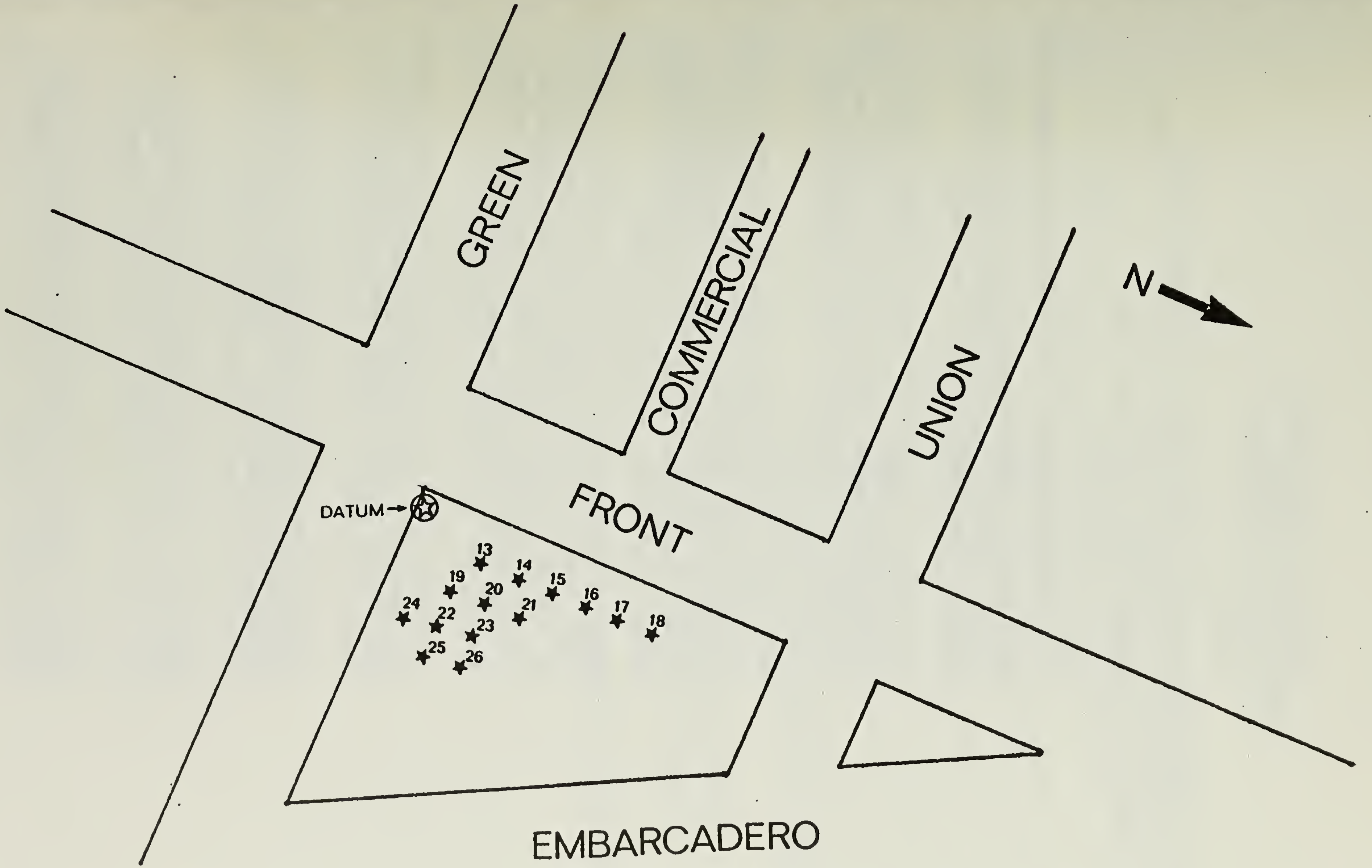


FIGURE 2: EMBARCADERO TERRACES
SITE LOCATION MAP AND PLACEMENT OF ARCHAEOLOGICAL
BORINGS, 1984 TESTING PROGRAM

Embarcadero Terraces

Boring # 13

Located 52 feet north and 30 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Dark brown, medium coarse sand mixed with gravel and fist sized angular rocks. Essentially devoid of cultural materials.
2-4 feet	Dark brown silty sand with abundant gravel and fist-to-head sized pieces of angular Telegraph Hill shale mixed throughout the matrix. A single rusted metal spike recovered from this level.
4-6 feet	Top half of this level same as above. At about five feet, an abrupt change to a yellow/tan silty sand mixed with gravel and fist-to-head sized chunks of angular Telegraph Hill shale. A single colorless fragment of window glass recovered from this level.
6-8 feet	Same yellow/tan silty sand as noted in previous level, still mixed with an sbundance of gravel and fist-to-head sized chunks of angular Telegraph Hill shale. First traces of moisture noted at about 8 feet. This level was devoid of cultural materials.
8-10 feet	Yellow/tan silty sand mixed with gravel and increasingly large chunks of angular Telegraph Hill shale. Water encountered at nine feet. This level was culturally sterile.
10-12 feet	Gravel mixed with increasingly large chunks of angular Telegraph Hill shale. One green glass bottle neck and a small piece of corroded metal recovered from this level.
12-14 feet	Same soil matrix as noted in the previous level. 36 inch casing placed in the boring at a depth of 14 feet. Culturally sterile.
14-16 feet	Same soil matrix as noted in the previous level, except the size and quantity of the large angular shale appears to be increasing. Culturally sterile.

Embarcadero Terraces

Boring # 13 (cont.)

Depth	Soil Composition and Cultural Characteristics
16-18 feet	Same soil matrix as noted in previous level. Culturally sterile.
18-20 feet	Same soil matrix as noted in previous level. Culturally sterile.
20-22 feet	Same soil matrix as noted in previous level. Culturally sterile.
22-24 feet	Same soil matrix as noted in previous level. Culturally sterile.
24-26 feet	Top half of level the same as noted above. Bay mud first encountered at a depth of 25 feet. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.
28-30 feet	Bay mud. Culturally sterile.

Boring abandoned at a depth of 30 feet.

EMBARCADERO TERRACES

Boring # 14

Located 72 feet north and 30 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Dark, fine brown sand mixed with gravel, charcoal, a thick lens of ash, brick fragments and an abundant quantity of fist-sized, angular shale. Other than the brick noted above, this level was culturally sterile.
2-4 feet	Same dark, fine brown sand, mixed with gravel, brick and fist-sized pieces of angular shale. Lip and base fragments of an aqua glass bottle recovered, but otherwise this level was culturally sterile.
4-6 feet	Top half of this level the same as noted above. At 5 feet, an abrupt change to a yellow-tan silty sand, mixed with gravel and fist-to-head sized fragments of angular Telegraph Hill shale. A marked decrease in the frequency of brick fragments below a depth of 5 feet. A few glass fragments and a single large, corroded, square-head metal spike recovered in this level.
6-8 feet	Soil composition the same as noted in the lower half of previous level: dense, yellow-tan silty sand mixed with gravel and increasingly large pieces of angular Telegraph Hill shale. First traces of moisture noted at 7½ feet. A few scattered glass fragments recovered in this level.
8-10 feet	Soil matrix the same as noted in the previous level. Water encountered at 9 feet. Culturally sterile.
10-12 feet	Soil matrix the same as noted in the previous level, except the size and frequency of angular, Telegraph Hill shale is increasing. Culturally sterile with the exception of a single splinter of pine.
12-14 feet	Basically the same as previous level: large quantities of angular, Telegraph Hill shale mixed with a dense, yellow-tan silty sand and gravel. Culturally sterile.

EMBARCADERO TERRACES

Boring # 14 (Cont.)

Depth	Soil Composition and Cultural Characteristics
14-16 feet	Soil matrix the same as previous level. Culturally sterile.
16-18 feet	Soil matrix the same as previous level. Culturally sterile.
18-20 feet	Soil matrix the same as previous level. Culturally sterile.
20-22 feet	Soil matrix the same as previous level. Culturally sterile.
22-24 feet	Top half of this level the same as previous level. First traces of bay mud encountered at a depth of approximately 23 feet. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.
28-30 feet	Bay mud. Culturally sterile.

Boring abandoned at a depth of 30 feet.

EMBARCADERO TERRACES

Boring # 15

Located 92 feet north and 30 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Dark, fine brown sand mixed with gravel and massive quantities of brick fragments. Some coal or slag fragments encountered. A few other types of cultural materials-- plain white stoneware porcelain and a few scraps of wood-- were found scattered throughout this level.
2-4 feet	Dark, fine brown sand mixed with gravel and large quantities of brick. Some plaster and other traces of building materials encountered. Also, several fragments of clear window glass were found scattered throughout this level.
4-6 feet	Top half of this level the same as above. At about 5 feet, an abrupt change to a yellow-tan silty sand mixed with gravel and fist-sized angular chunks of Telegraph Hill shale. A single fragment of clear window glass recovered. The brick which was so prominent in previous levels has all but disappeared below a depth of 5 feet
6-8 feet	Soil composition the same as noted in the lower half of previous level: yellow-tan silty sand mixed with gravel and increasingly large chunks of angular Telegraph Hill shale. Some cultural materials found scattered throughout this level: a piece of bone, several fragments of bottle and window glass, and one large corroded metal bolt. First traces of moisture noted at approximately 8 feet.
8-10 feet	Same soil composition as noted in previous level. However, it should be noted that there is less of the angular Telegraph Hill shale than was noted at this depth in Borings 13 and 14, 40 and 20 feet to the south, respectively. Three fragments of clear window glass recovered in this level. Water encountered at 10 feet.
10-12 feet	Telegraph Hill shale mixed with a dense, yellow-tan silty sand. One bottle base recovered at a depth of 12 feet, but otherwise culturally sterile.

EMBARCADERO TERRACES

Boring # 15 (Cont.)

Depth	Soil Composition and Cultural Characteristics
12-14 feet	Soil matrix the same as noted in previous level. Culturally sterile.
14-16 feet	Soil matrix the same as noted in previous level. Culturally sterile.
16-18 feet	Same as above: large pieces of angular Telegraph Hill shale mixed with a yellow-tan silty sand. Culturally sterile.
18-20 feet	Soil composition the same as noted in previous level. Culturally sterile.
20-22 feet	Soil composition the same as noted in previous level. Culturally sterile.
22-24 feet	Top half of level the same as noted above. First traces of bay mud noted at an approximate depth of 23 feet. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.
28-30 feet	Bay mud. Culturally sterile.

Boring abandoned at a depth of 30 feet

EMBARCADERO TERRACES

Boring # 16

Located 112 feet north and 30 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Fine, dark brown sand mixed with gravel and brick. A few pieces of broken glass scattered thinly throughout this level.
2-4 feet	Same fine, dark brown sand mixed with gravel as above. Fragments of brick, plaster and other building materials encountered. One large animal bone recovered in this level as well.
4-6 feet	Same as above: fine, dark brown sand mixed with brick, plaster and other construction materials. One bone fragment and several pieces of clear window glass recovered in this level.
6-8 feet	The fine, dark brown sand noted above is now mixed with increasing quantities of large, angular Telegraph Hill shale. First traces of moisture at a depth of 7 feet. Only two fragments of clear window glass noted in this level.
8-10 feet	An abrupt change to a dense, yellow-tan silty sand mixed with gravel and fist-sized chunks of angular Telegraph Hill shale. Water encountered at 9 feet. A single aqua bottle neck recovered at a depth of approximately 8½ feet.
10-12 feet	Soil composition the same as noted in the previous level. Amount and size of the angular Telegraph Hill shale is increasing with depth. One fragment of clear window glass and a single piece of animal bone noted in this level.
12-14 feet	Soil composition the same as noted in the previous level. Culturally sterile.
14-16 feet	Large amounts of fist-to-head sized chunks of angular Telegraph Hill shale mixed with a dense, yellow-tan silty sand and gravel. Culturally sterile.
16-18 feet	Soil composition the same as noted in the previous level. Culturally sterile.

EMBARCADERO TERRACES

Boring # 16 (Cont.)

Depth	Soil Composition and Cultural Characteristics
18-20 feet	Soil composition the same as noted in the previous level. Culturally sterile.
20-22 feet	Soil composition the same as noted in the previous level. Culturally sterile.
22-24 feet	Bay mud encountered. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.
	Boring abandoned at a depth of 28 feet.

EMBARCADERO TERRACES

Boring # 17

Located 132 feet north and 30 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Fine, dark brown sand mixed with gravel. Some brick fragments and a few pieces of broken, clear window glass noted. Otherwise culturally sterile.
2-4 feet	Same fine, dark brown sand and gravel mixture as noted above. Large quantities of ash, brick, plaster and other building materials encountered. Several fragments of clear window glass recovered from this level as well.
4-6 feet	Soil composition the same as noted in previous level: fine, dark brown sand mixed with gravel, brick, plaster and other construction materials Except for a few scattered fragments of clear window glass, no other cultural objects encountered.
6-8 feet	Soil composition the same as noted in the previous level. First traces of moisture noted at 7½ feet. Brick fragments, plaster and two large slabs of marble building facing encountered, but no other cultural objects.
8-10 feet	Soil composition is basically the same as noted in the previous level. However, the first signs of large quantities of angular Telegraph Hill shale appear at an approximate depth of 9½ feet Water encountered at 10 feet. Culturally sterile.
10-12 feet	An abrupt change to a dense, yellow-tan silty sand mixed with gravel and large quantities of fist-to-head sized chunks of angular Telegraph Hill shale. One corroded metal fitting found in this level, but otherwise culturally sterile
12-14 feet	Soil composition is bascially the same as noted in the previous level, except the size and quantity of the Telegraph Hill shale has demonstrably increased. Culturally sterile.
14-16 feet	Soil composition the same as noted in the previous level. Culturally sterile.

EMBARCADERO TERRACES

Boring # 17 (Cont.)

Depth	Soil Composition and Cultural Characteristics
16-18 feet	Large chunks of angular Telegraph Hill shale mixed with yellow-tan silty sand. Culturally sterile.
18-20 feet	Soil composition the same as noted in the previous level. Culturally sterile.
20-22 feet	Top half of level the same as noted above. First traces of bay mud noted in the lower half of this level. Culturally sterile.
22-24 feet	Bay Mud. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.

Boring abandoned at a depth of 28 feet.

EMBARCADERO TERRACES

Boring # 18

Located 152 feet north and 30 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Fine, dark brown sand mixed with gravel. Culturally sterile.
2-4 feet	An abrupt change to a light brown, extremely fine sand, with little admixture of gravel. A few fragments of brick and three pieces of a white stoneware porcelain plate recovered from this level.
4-6 feet	The same light brown, extremely fine sand as noted in the previous level, now mixed with brick, plaster and other construction rubble. In addition, a few fragments of clear window glass, as well as two pieces of a white stoneware procelain plate, were recovered in this level.
6-8 feet	Soil composition is basically the same as in the previous level: light brown, extremely fine sand, mixed with brick fragments, plaster and other evidence of construction rubble. In addition, the first signs of angular chunks of fist-to-head sized Telegraph Hill shale can be seen in this level. The first traces of moisture appear at about 8 feet. One 18 inch corroded metal fitting recovered, as well as the base of a thick ceramic beer or ale bottle.
8-10 feet	Soil matrix is the same as the previous level. The size and frequency of the angular chunks of Telegraph Hill shale is increasing. Water encountered at a depth of 10 feet. Culturally sterile.
10-12 feet	Soil matrix is the same as noted in the previous level. Size and frequency of the angular chunks of Telegraph Hill shale still increasing. Culturally sterile.
12-14 feet	Soil matrix is the same as noted in the previous level. Culturally sterile.
14-16 feet	The light brown, extremely fine sand noted above has all but disappeared. This level consists almost entirely of large, angular

EMBARCADERO TERRACES

Boring # 18 (Cont.)

Depth	Soil Composition and Cultural Characteristics
14-16 feet (cont.)	chunks of Telegraph Hill shale mixed with a dense, yellow-tan silty sand. Culturally sterile.
16-18 feet	Soil matrix is the same as noted in the previous level. Culturally sterile.
18-20 feet	Soil matrix is the same as noted in the previous level. Culturally sterile.
20-22 feet	Top half of level is the same as noted above. Bay mud first encountered in the lower half of this level. Culturally sterile.
22-24 feet	Bay mud. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.

Boring abandoned at a depth of 28 feet.

EMBARCADERO TERRACES

Boring # 19

Located 40 feet north and 50 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Fine, dark brown sand mixed with gravel and brick fragments. One piece of rusted metal encountered, but no other cultural materials.
2-4 feet	Same fine, dark brown sand as above, mixed with gravel, brick fragments and construction rubble. A lens of yellow-tan clay appears near the bottom of this level. Cultural materials consist of several fragments of clear window glass and three pieces of corroded metal.
4-6 feet	Top half of this level is the same as noted in the lower portion of the previous level: fine, dark brown sand, mixed with a lens of yellow-tan clay, gravel, brick and construction rubble. At 5 feet, an abrupt change to a dense, gray/black clay mixed with wood, a fragment of a Chinese celadon plate, the remains of a leather shoe and a green glass bottle base.
6-8 feet	Same dense, gray/black clay as above, mixed with a substantial quantity of wood as well as a variety of cultural materials: leather fragments, bottle and window glass, the fragmentary remains of several ceramic vessels, bone and several pieces of unidentifiable corroded metal.
8-10 feet	Same dense gray/black clay as in the previous level, mixed with an abundance of cultural materials: glass, leather, a complete shoe, brick, corroded metal, ceramic fragments and a substantial quantity of wood.
10-12 feet	Same dense, gray/black clay as in the previous level, now mixed with fist-to-head sized chunks of angular Telegraph Hill shale. A number of large pieces of wood recovered in this level. A thin strip of brass wire also recovered in this level. There is a marked decrease in the amount of other cultural items-- glass, ceramic ware, bone, leather and metal-- in this level compared to the two previous levels. Water encountered at 12 feet.

EMBARCADERO TERRACES

Boring # 19 (Cont.)

Depth	Soil Composition and Cultural Characteristics
12-14 feet	Dense gray/black clay mixed with fist-to-head sized chunks of angular Telegraph Hill shale as well as dark brown sand. Substantial quantities of wood encountered throughout this level, but few other cultural items.
14-16 feet	Soil composition the same as the previous level. Numerous wood specimens still in evidence, but few other cultural objects.
16-18 feet	Same soil matrix as the previous level. Some wood still in evidence, but less than the previou level. No other cultural specimens.
18-20 feet	Same soil matrix as described for the previous level. Markedly less wood than above, although a few examples still in evidence. No other cultural materials.
20-22 feet	Bay mud. Culturally sterile.
22-24 feet	Bay mud. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.
28-30 feet	Bay mud. Culturally sterile.

Boring abandoned at a depth of 30 feet.

EMBARCADERO TERRACES

Boring # 20

Located 60 feet north and 50 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Fine, light brown sand, mixed with gravel, some brick fragments and a single fragment of a plain, white stoneware procelain plate.
2-4 feet	Extremely fine, light brown sand with almost no admixture of gravel. Approximately one dozen pieces of unidentifiable, corroded metal and several fragments of an aqua glass bottle were encountered in this level.
4-6 feet	The extremely fine, light brown sand noted above is now mixed with fist sized chunks of angular Telegraph Hill shale. Several fragments of clear window glass encountered in this level.
6-8 feet	Fine, light brown sand now mixed with dense, gray/black clay and some wood. First traces of moisture encountered at 8 feet. Numerous cultural objects encountered in this level-- bottle and window glass fragments, bone, ceramic fragments, several pieces of unidentifiable, corroded metal and a complete brick.
8-10 feet	This level consists of wet, dark brown sand mixed with gravel and fist-to-head sized chunks of angular Telegraph Hill shale. Water encountered at 10 feet. A substantial quantity of wood recovered from this level, along with an abundance of other cultural materials-- glass fragments, broken ceramic ware, bone, several strands of metal wire as well as scraps of leather and burlap.
10-12 feet	Wet, dark brown sand mixed with gravel and increasingly large chunks of angular Telegraph Hill shale. A substantial quantity of wood recovered from this level. The other types of cultural objects noted in the previous level are still in evidence, but in lesser quantities than above.
12-14 feet	Soil composition is the same as noted for the previous level. The size and amount of angular

EMBARCADERO TERRACES

Boring # 20 (Cont.)

Depth	Soil Composition and Cultural Characteristics
12-14 feet (cont.)	chunks of Telegraph Hill shale has increased from previous level. A substantial quantity of wood recovered from this level. Other types of cultural objects are still in evidence but in demonstrably lesser amounts than noted above.
14-16 feet	Large chunks of angular Telegraph Hill shale mixed with dark brown sand. Sunstantial quantities of wood still in evidence, but essentially devoid of other cultural materials.
16-18 feet	Soil matrix identical to that noted for the previous level. This level yielded a substantial amount of wood, but no other cultural specimens.
18-20 feet	Soil matrix identical to that noted for the previous level. Some wood still in evidence, but in much lesser amounts than above. No other cultural materials observed in this level.
20-22 feet	Soil matrix identical to that noted for the previous level. Culturally sterile.
22-24 feet	An abrupt change to bay mud. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.
28-30 feet	Bay mud. Culturally sterile.
	Boring abandoned at a depth of 30 feet.

EMBARCADERO TERRACES

Boring # 21

Located 80 feet north and 50 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Fine, dark brown sand mixed with gravel and cultural objects-- window and bottle glass fragments, a rusted metal spike, broken ceramic ware, bone and brick fragments.
2-4 feet	Same matrix of fine, dark brown sand, mixed with gravel and a scattering of cultural materials, as above.
4-6 feet	Almost pure, fine, light brown sand with a scattering of cultural items throughout the matrix-- window and bottle glass fragments, rusted pieces of metal, some wood and broken ceramic ware.
6-8 feet	Same as above level, with the same scattering of cultural materials. First traces of moisture at approximately 8 feet.
8-10 feet	Same as above level. No appreciable change in the nature of sand matrix. A scattering of cultural materials-- window and bottle glass fragments, pieces of leather, broken ceramic ware, corroded metal-- still found in small quantities throughout the level. Water encountered at 10 feet.
10-12 feet	Soil matrix the same as noted in the previous level. A few scattered cultural objects were recovered from this level.
12-14 feet	Sand now mixed with appreciable quantities of fist-to-head sized chunks of angular Telegraph Hill shale. A few scattered cultural objects-- a ceramic pipe stem, an aqua glass bottle base, a rusted metal bolt-- can still be found.
14-16 feet	Same as above, with a demonstrable increase in the size and quantity of angular chunks of Telegraph Hill shale. Only two glass bottle fragments recovered from this level; otherwise, culturally sterile.
16-18 feet	Same as above level. The size and quantity of Telegraph Hill shale continues to increase. Culturally sterile.

EMBARCADERO TERRACES

Boring # 21 (Cont.)

Depth	Soil Composition and Cultural Characteristics
18-20 feet	This level is composed almost entirely of large, angular peices of Telegraph Hill shale. Culturally sterile.
20-22 feet	Soil matrix the same as above level. Culturally sterile.
22-24 feet	Bay mud encountered. Culturally aterile.
24-26 feet	Bay mud. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.
28-30 feet	Bay mud. Culturally sterile.
	Boring abandoned at a depth of 30 feet.

EMBARCADERO TERRACES

Boring # 22

Located 40 feet north and 70 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Fine, dark brown sand mixed with gravel and some cultural debris-- one piece of rusted metal, several brick fragments and two fragments of an aqua glass bottle.
2-4 feet	Same fine, dark brown sand as noted above, mixed with substantially more gravel than was noted in the previous level. A few scattered cultural items encountered-- several small pieces of wood, two green glass bottle fragments, one rusted metal spike.
4-6 feet	Soil composition the same as noted in the previous level. This level also contains a similar scattering of cultural objects as noted above-- several scraps of wood, two fragments of clear window glass, one large cobble and about six fragments of brick.
6-8 feet	Soil composition the same as noted in the previous level: fine, dark brown sand mixed with gravel and a scattering of cultural debris. Cultural materials in this level consist of several scraps of wood, three unidentifiable pieces of corroded metal, one fragment of a plain, white stoneware porcelain plate and three pieces of clear window glass. The first traces of moisture noted at 8 feet.
8-10 feet	Soil composition the same as noted in the previous level. Also, this level yielded a similar scattering of fragmentary cultural items.
10-12 feet	Same sand and gravel matrix as described above, but now mixed with an occasional lens of dense, gray/black clay. Soil is increasingly moist, but the auger has not yet encountered the water level. Also, as yet there is no sign of the ubiquitous Telegraph Hill shale that has characterized the more westerly borings (closer to the line of Front Street) within the project area below a depth of 8 feet. A substantial amount of wood and other cultural debris-- glass, ceramic ware, bone, corroded metal-- recovered from this level.

EMBARCADERO TERRACES

Boring # 22 (Cont.)

Depth	Soil Composition and Cultural Characteristics
12-14 feet	Same sand, clay and gravel matrix as noted above. As above, a substantial amount of wood recovered from this level, as well as a relatively large concentration of other cultural materials-- glass and leather fragments, broken ceramic ware, bone and a number of unidentifiable pieces of corroded metal. A large amount of hay, or straw, was encountered in this level, as well.
14-16 feet	This level was composed primarily of dense, gray/ black clay, mixed with decreasing amounts of sand and gravel. While moisture is apparent, the water level has still not been reached. Several large pieces of wood encountered, as well as a similar scattering of cultural objects to those described for the previous two levels.
16-18 feet	Dense, gray/black clay mixed now with only a small amount of sand and gravel. This clay is certainly the bay mud. Several large fragments of wood encountered, as well as a few fragments of glass, bone and broken ceramic ware.
18-20 feet	Bay mud. Water encountered at 20 feet. Culturally sterile.
20-22 feet	Bay mud. Culturally sterile.
22-24 feet	Bay mud. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.

Boring abandoned at a depth of 28 feet.

EMBARCADERO TERRACES

Boring # 23

Located 60 feet north and 70 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Dark brown sand mixed with gravel, brick rubble and cultural debris-- a broken Chinese stoneware jar, one 12 inch long piece of hand-forged iron, window and bottle glass, three bone fragments.
2-4 feet	Same mixture of dark brown sand, gravel, brick and cultural debris as above. Artifacts in this level include bottle glass fragments, three corroded metal bolts, stoneware ceramic fragments and several leather scraps.
4-6 feet	As above, dark brown sand mixed with gravel and a scattering of cultural refuse-- bottle glass fragments, several scraps of wood, two pieces of unidentifiable rusted metal and bone.
6-8 feet	Same soil matrix as noted in the previous level. First traces of moisture at 8 feet. Quantity and type of cultural objects is about the same as noted in the previous two levels: bottle and window glass some wood, bone, broken ceramic ware and several pieces of unidentifiable, rusted metal.
8-10 feet	Soil matrix is the same as noted in the previous level: dark brown sand, mixed with gravel and a scattering of cultural refuse. Artifacts include bottle and window glass fragments, wood, some bone, several pieces of unidentifiable, corroded metal and three fragments of a broken Chinese celadon plate.
10-12 feet	Dark brown sand and gravel, now mixed with a dense, gray/black clay. Water encountered at 12 feet. A marked decrease in the amount of cultural materials encountered in this level. Several scraps of wood, one leather scrap and two pieces of broken green bottle glass comprise all of the artifacts recovered from this level.
12-14 feet	Soil composition is the same as noted in the previous level. A single rusted metal bolt and three fragments of a green glass bottle were the only cultural items recovered in this level.

EMBARCADERO TERRACES

Boring # 23 (Cont.)

Depth	Soil Composition and Cultural Characteristics
14-16 feet	Soil composition the same as noted in the previous level. A small scattering of cultural items is still in evidence-- a few scraps of wood, two rusted metal bolts, a piece of leather and four fragments of green bottle glass.
16-18 feet	Same sand, gravel and clay mixture as noted in the previous level, with a similar scattering of cultural materials as noted above-- a few fragments of bone, ceramic and glass as well as wood scraps and two pieces of unidentifiable, corroded metal.
18-20 feet	Still a mixture of sand, gravel and dense, gray/black clay, although the amount of clay has increased dramatically from the previous level. The same scattering of cultural items as reported for the previous levels-- a few glass fragments, some rusted metal, a few pieces of broken ceramic ware, brick fragments and some wood.
20-22 feet	An abrupt change to bay mud. Culturally sterile.
22-24 feet	Bay mud. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
26-28 feet	Bay mud. Culturally sterile.
28-30 feet	Bay mud. Culturally sterile.

Boring abandoned at a depth of 30 feet.

EMBARCADERO TERRACES

Boring # 24

Located 20 feet north and 70 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Dark brown sand, mixed with gravel and fist-sized pieces of angular Telegraph Hill shale. A few cultural objects scattered throughout the matrix--three bottle glass fragments, a piece of a rusted metal bolt, some brick fragments and two fragments of a brown glazed stoneware Chinese jar.
2-4 feet	A mixture of fine, dark brown sand and gravel, with markedly less of the angular, Telegraph Hill shale than was noted in the previous level. A few, scattered cultural objects noted in this level-- several bottle glass fragments, two pieces of broken ceramic ware, one rusted metal bolt and a few brick fragments.
4-6 feet	The same fine, dark brown sand, mixed with gravel, ash, brick fragments and a layer of oyster shells. There were only a few cultural objects found in this level-- several fragments of bottle glass and a rusted metal spike.
6-8 feet	An abrupt change to a wet sandy clay, mixed with gravel and fist sized chunks of angular Telegraph Hill rock. Water at 8 feet. Only a few cultural items-- mainly bottle glass fragments-- were encountered in this level.
8-10 feet	Sand mixed with dense gray/black clay. A few scattered pieces of wood, as well as a green glass bottle base were recovered from this level.
10-12 feet	The same dense, gray/black clay mixed with dark brown sand, as above. A few pieces of wood, three fragments of bottle glass and a rusted metal bolt were recovered from this level.
12-14 feet	Soil composition the same as the previous level. As above, several pieces of wood and a few fragments of bottle glass were recovered from this level.
14-16 feet	Soil composition is basically the same as the above level, although the clay is becoming the dominant element in the soil matrix. The cultural

EMBARCADERO TERRACES

Boring # 24 (Cont.)

Depth	Soil Composition and Cultural Characteristics
14-16 feet (cont.)	materials are less in evidence as the auger proceeds downward. Only three small scraps of wood were recovered from this level.
16-18 feet	Bay mud. Culturally sterile.
18-20 feet	Bay mud. Culturally sterile.
20-22 feet	Bay mud. Culturally sterile.
22-24 feet	Bay mud. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
	Boring abandoned at a depth of 26 feet.

EMBARCADERO TERRACES

Boring # 25

Located 40 feet north and 90 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Dark brown sand, mixed with gravel, clay and some small pieces of angular rock. Some brick fragments and a few scraps of wood encountered but no other cultural materials.
2-4 feet	Dark brown sand, mixed with gravel and fist sized peices of angular Telegraph Hill shale. A few brick fragments as well as one fragment of a plain, white stoneware porcelain plate were recovered from this level, but no other cultural items were encountered.
4-6 feet	Same dark brown sand, mixed with gravel and fist sized pieces of angular, Telegraph Hill shale. Cultural materials in this level consisted of a few peices of wood, a piece of a painted, Chinese procelain plate, a green glass bottle base and three fragments of a brown-glazed stoneware, Chinese jar.
6-8 feet	Soil composition is the same as noted in the previous level. Water encountered at 8 feet. Cultural materials are thinly scattered throughout this level. Items recovered included a metal nail, a tin can, several pieces of wood, and a fragment of a Chinese celadon bowl.
8-10 feet	Dense, gray/black clay mixed with dark brown sand and gravel. A few peices of wood and thre fragments of bottle glass were recovered from this level.
10-12 feet	Soil composition is basically the same as note in the previous level, although the density and frequency of the clay is increasing. Only a few fragments of glass and some small pieces of wood were encountered.
12-14 feet	Soil composition is the same as noted in the previous level. The frequency of cultural materials is decreasing. This level contained a few specimens of wood, including a hand shaped dowel, as well as a layer of hay, or straw.

EMBARCADERO TERRACES

Boring # 25 (Cont.)

Depth	Soil Composition and Cultural Characteristics
14-16 feet	Dense, gray/black clay. Culturally sterile
16-18 feet	Bay mud. Culturally sterile.
18-20 feet	Bay mud. Culturally sterile.
20-22 feet	Bay mud. Culturally sterile.
22-24 feet	Bay mud. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.

Boring abandoned at a depth of 26 feet.

EMBARCADERO TERRACES

Boring # 26

Located 60 feet north and 90 feet east of project datum

This boring was excavated with a 24 inch auger

Depth	Soil Composition and Cultural Characteristics
0-2 feet	Dark brown sand, mixed with gravel and yellow-tan clay. Cultural materials include some brick fragments, a rusted metal strip, one piece of plain, white stoneware procelain and several fragments of bottle glass.
2-4 feet	Fine, dark brown sand, mixed with extremely fine gray sand and gravel. A few scattered cultural objects found throughout this level--several brick fragments, two pieces of green bottle glass and two fragments of a plain, white stoneware procelain plate.
4-6 feet	Dark brown sand, mixed with gravel and small pieces of angular Telegraph Hill shale. A substantial quantity of brick encountered in this level. Other cultural specimens include bottle glass fragments, some rusted metal wire, a few peices of wood, and a large chunk of lead.
6-8 feet	Dark gray silty sand. First traces of moisture encountered at 8 feet. One metal wire and two bottle glass fragments were the only cultural objects recovered from this level.
8-10 feet	Soil composition is the same as noted in the previous level. Water at 10 feet. A few pieces of wood and a large fragment of a plain, white stoneware porcelain plate were the only cultural items encountered in this level.
10-12 feet	The silt noted above is turning to a dense, gray/black clay, mixed with some sand and gravel. Cultural materials are diminishing in frequency. Only two small pieces of wood and one green glass bottle base were recovered in this level.
12-14 feet	Soil composition is the same as noted in the previous level. Cultural materials consist of two small pieces of wood and a single fragment of bottle glass.

EMBARCADERO TERRACES

Boring # 26 (Cont.)

Depth	Soil Composition and Cultural Characteristics
14-16 feet	Soil composition is the same as noted in the previous level. Three scraps of wood and two fragments of bottle glass recovered from this level.
16-18 feet	An abrupt change to bay mud. Culturally sterile.
18-20 feet	Bay mud. Culturally sterile.
20-22 feet	Bay mud. Culturally sterile.
22-24 feet	Bay mud. Culturally sterile.
24-26 feet	Bay mud. Culturally sterile.
	Boring abandoned at a depth of 26 feet.

References Cited

Olmsted, Roger, Nacy Olmsted and Allen G. Pastron
1977
San Francisco Waterfront: Report on Historical Cultural Resources, Report submitted to the Wastewater Management Program, City and County of San Francisco.

Pastron, Allen G.
1982
Letter Report on the Pre-construction Archaeological Testing Program at Embarcadero Terraces (Seawall Lot 321), along the San Francisco Waterfront. Report submitted to Mr. Stu During of Environmental Imapct Planning Corporation, San Francisco, 8 July, 1982

Pastron, Allen G., and Jack Prichett
1979
The Ship at Levi's Plaza: Archaeological Investigation on San Francisco's Northeastern Waterfront , Report submitted to Blue Jeans Equities West, San Francisco

APPENDIX C

The following material and tables replace Table C-1, page A-46 and are added to the Transportation Appendix in the DEIR:

TABLE C-1

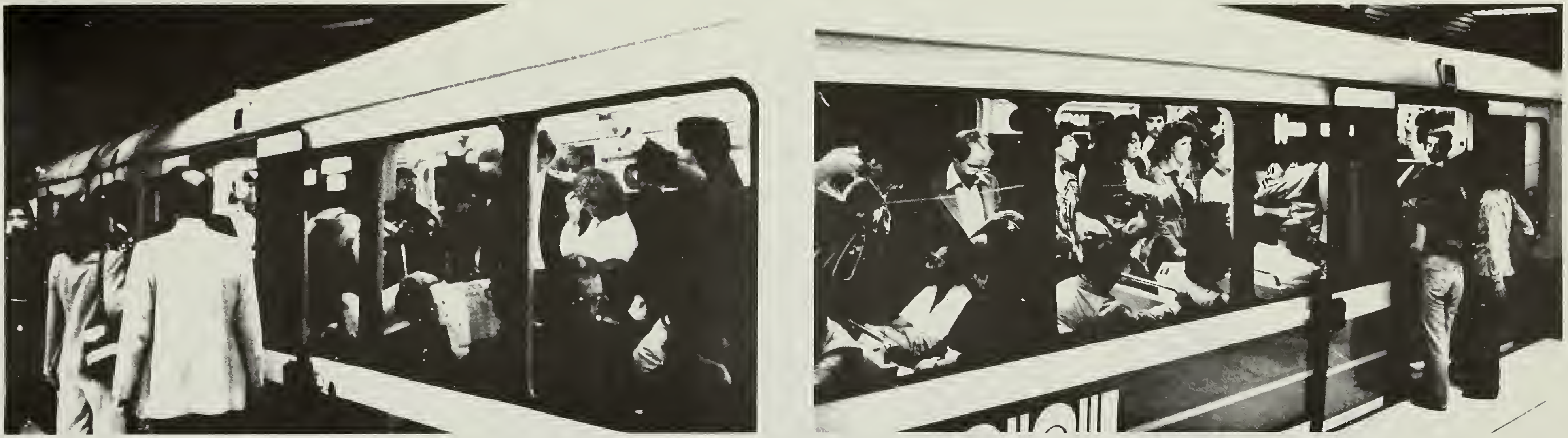
PASSENGER LEVELS OF SERVICE ON BUS TRANSIT

	Volume/Capacity (v/c) Ratio*
Level of Service A Level of Service A describes a condition of excellent passenger comfort. Passenger loadings are low with less than half the seats filled. There is little or no restriction on passenger maneuverability. Passenger loading times do not affect scheduled operation.	0.00-0.50
Level of Service B Level of Service B is in the range of passenger comfort with moderate passenger loadings. Passengers still have reasonable freedom of movement on the transit vehicle. Passenger loading times do not affect scheduled operations.	0.51-0.75
Level of Service C Level of Service C is still in the zone of passenger comfort, but loadings approach seated capacity and passenger maneuverability on the transit vehicle is beginning to be restricted. Relatively satisfactory operating schedules are still obtained as passenger loading times are not excessive.	0.76-1.00
Level of Service D Level of Service D approaches uncomfortable passenger conditions with tolerable numbers of standees. Passengers have restricted freedom to move about on the transit vehicle. Conditions can be tolerated for short periods of time. Passenger loadings begin to affect schedule adherence as the restricted freedom of movement for passengers requires longer loading times.	1.01-1.25
Level of Service E Level of Service E passenger loadings approach manufacturers' recommended maximums and passenger comfort is at low levels. Freedom to move about is substantially diminished. Passenger loading times increase as mobility of passengers on the transit vehicle decreases. Scheduled operation is difficult to maintain at this level. Bunching of buses tends to occur which can rapidly cause operations to deteriorate.	1.26-1.50

Level of Service F

Level of Service F describes crush loadings. Passenger comfort and maneuverability is extremely poor. Crush loadings lead to deterioration of scheduled operations through substantially increased loading times.	1.51-1.60

Source: Interim Materials on Highway Capacity, Transportation Research Circular 212, pages 73-113, Transportation Research Board, 1980.

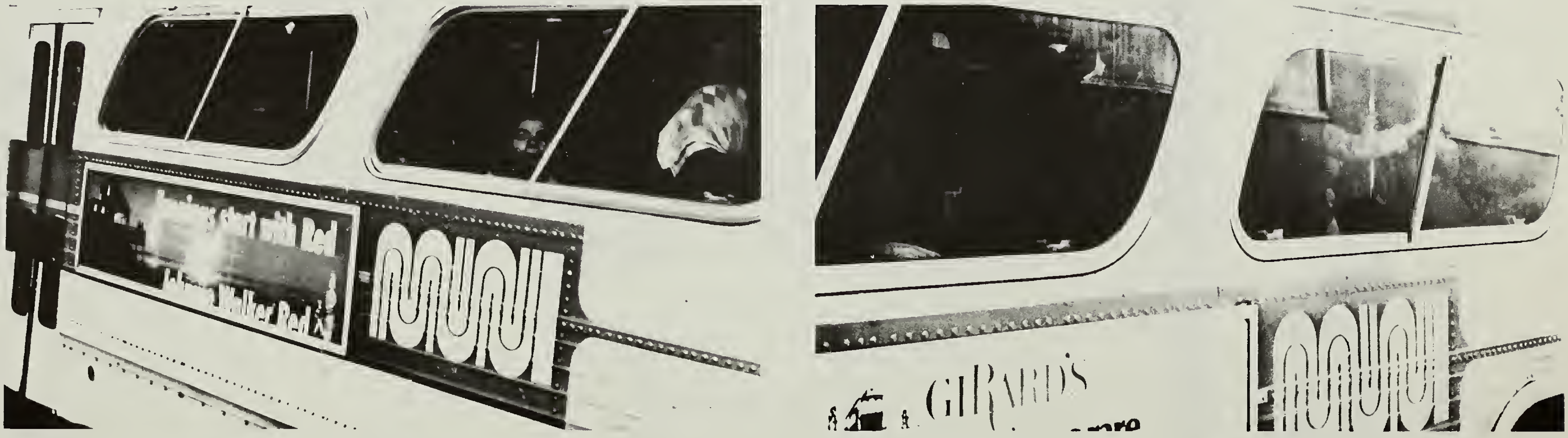


K INGLESIDE - VAN NESS STATION

Wednesday, September 9, 1981 - 8:00 A.M. - Inbound

N JUDAH - VAN NESS STATION

Wednesday, September 16, 1981 - 5:00 P.M. Outbound



38 GEARY - VAN NESS AVE. AND O'FARRELL ST.

Wednesday, October 21, 1981 - 9:00 A.M. - Inbound

38 GEARY - VAN NESS AVE. AND GEARY BLVD.

Wednesday, October 21, 1981 - 4:20 P.M. - Outbound

SOURCE: ESA

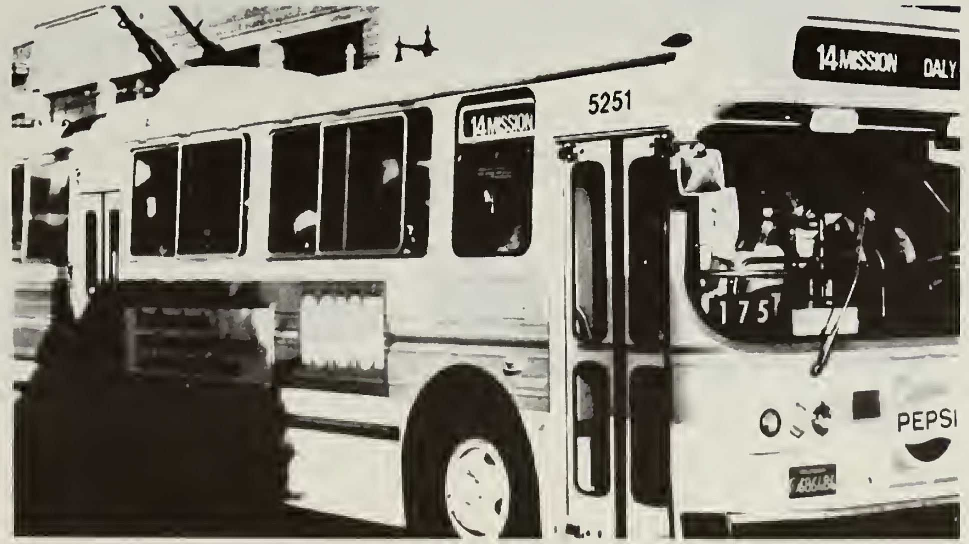
FIGURE C-1:
PHOTOS OF PEAK MUNI LOADING CONDITIONS

M OCEAN VIEW - CIVIC CENTER STATION

Wednesday, September 9, 1981 - 8:20 A.M. - Inbound

L TARAVAL - VAN NESS STATION

Wednesday, September 16, 1981 - 4:50 P.M. - Outbound



14 MISSION - MISSION STREET AND SOUTH VAN NESS AVE.

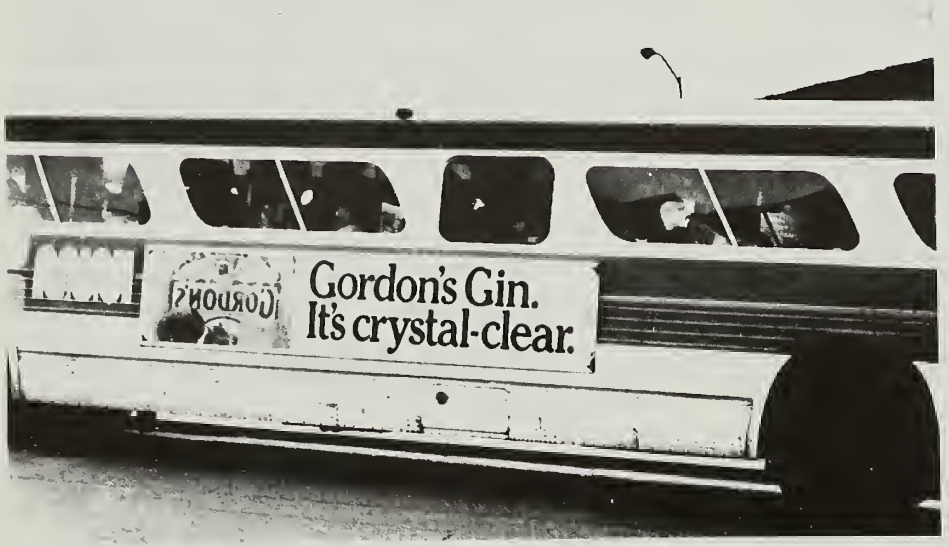
Tuesday, September 29, 1981 - 5:45 P.M. - Outbound

N JUDAH - DUBOCE AND CHURCH

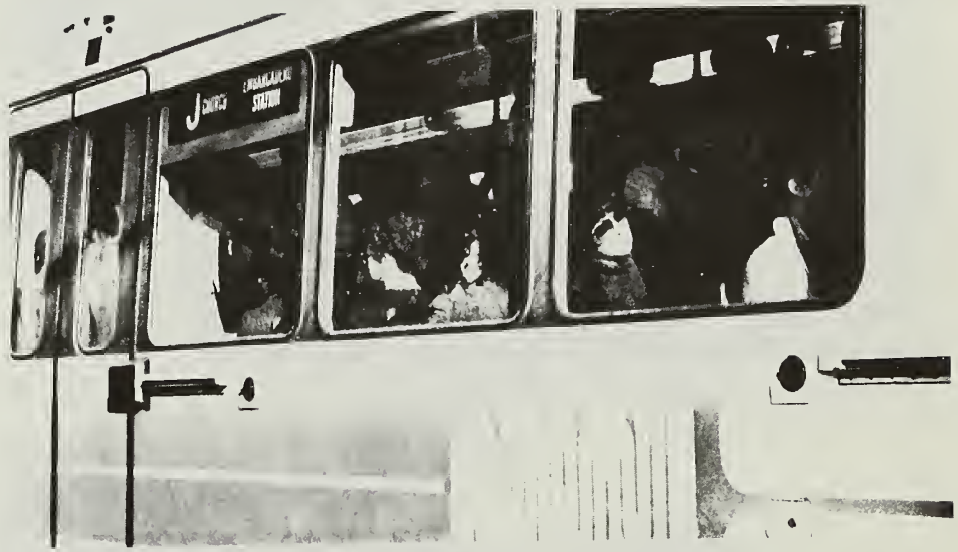
Wednesday, June 8, 1983 - 8:00 A.M. Inbound

FIGURE C-1 (CONTINUED):
PHOTOS OF PEAK MUNI LOADING CONDITIONS

SOURCE: ESA



30X MARINA EXPRESS - BAYSHORE AVE. AND ARIETA AVE.
Wednesday, October 7, 1981 - 8:00 A.M. - Inbound



J CHURCH - CHURCH ST. AND DUBOCE AVE.
Tuesday, September 29, 1981 - 9:00 A.M. - Inbound

SOURCE: ESA

FIGURE C-1 (CONTINUED):
PHOTOS OF PEAK MUNI LOADING CONDITIONS

INTERSECTION ANALYSIS

The capacity analysis of each intersection at which a turning movement count was made utilized the "critical lane" method. This method of capacity calculation is a summation of maximum conflicting approach lane volumes that gives the capacity of an intersection in vehicles per hour per lane. (This method is explained in detail in an article entitled "Intersection Capacity Measurement Through Critical Movement Summations: A Planning Tool," by Henry B. McInerney and Stephen G. Peterson, January 1971, Traffic Engineering. This method is also explained in "Interim Materials on Highway Capacity", Transportation Research Circular No. 212, Transportation Research Board, January 1980). The maximum service volume for Level of Service E was assumed as intersection capacity. A service volume is the maximum number of vehicles that can pass an intersection during a specified time period in which operating conditions are maintained corresponding to the selected and specified Level of Service (see Table C-3). For each intersection analyzed, the existing peak-hour volume was computed and a volume-to-capacity (v/c) ratio was calculated by dividing the existing volume by the capacity at Level of Service E.

TABLE C-3: VEHICULAR LEVELS OF SERVICE AT SIGNALIZED INTERSECTIONS

Level of Service	Description	Volume/Capacity (v/c) Ratio/a/
A	Level of Service A describes a condition where the approach to an intersection appears quite open and turning movements are made easily. Little or no delay is experienced. No vehicles wait longer than one red traffic signal indication. The traffic operation can generally be described as excellent.	less than 0.60
B	Level of Service B describes a condition where the approach to an intersection is occasionally fully utilized and some delays may be encountered. Many drivers begin to feel somewhat restricted within groups of vehicles. The traffic operation can generally be described as very good.	0.61-0.70
C	Level of Service C describes a condition where the approach to an intersection is often fully utilized and back-ups may occur behind turning vehicles. Most drivers feel somewhat restricted, but not objectionably so. The driver occasionally may have to wait more than one red traffic signal indication. The traffic operation can generally be described as good.	0.71-0.80
D	Level of Service D describes a condition of increasing restriction causing substantial delays and queues of vehicles on approaches to the intersection during short times within the peak period. However, there are enough signal cycles with lower demand such that queues are periodically cleared, thus preventing excessive back-ups. The traffic operation can generally be described as fair.	0.81-0.90
E	Capacity occurs at Level of Service E. It represents the most vehicles that any particular intersection can accommodate. At capacity there may be long queues of vehicles waiting up-stream of the intersection and vehicles may be delayed up to several signal cycles. The traffic operation can generally be described as poor.	0.91-1.00
F	Level of Service F represents a jammed condition. Back-ups from locations downstream or on the cross street may restrict or prevent movement of vehicles out of the approach under consideration. Hence, volumes of vehicles passing through the intersection vary from signal cycle to signal cycle. Because of the jammed condition, this volume would be less than capacity.	1.01+

/a/ Capacity is defined as Level of Service E.

SOURCE: San Francisco Department of Public Works, Traffic Division, Bureau of Engineering from Highway Capacity Manual, Highway Research Board, 1965

TABLE C-4: TRAFFIC LEVELS OF SERVICE FOR FREEWAYS

Level of Service	Description	Volume/Capacity (v/c) Ratio/a/
A	Level of Service A describes a condition of free flow, with low volumes and high speeds. Traffic density is low, with speeds controlled by driver desires, speed limits, and physical roadway conditions. There is little or no restriction in maneuverability due to the presence of other vehicles, and drivers can maintain their desired speeds with little or no delay.	0.00- 0.60
B	Level of Service B is in the higher speed range of stable flow, with operating speeds beginning to be restricted somewhat by traffic conditions. Drivers still have reasonable freedom to select their speed and lane of operation. Reductions in speed are not unreasonable, with a low probability of traffic flow being restricted.	0.61- 0.70
C	Level of Service C is still in the zone of stable flow, but speeds and maneuverability are more closely controlled by the highervolumes. Most of the drivers are restricted in their freedom to select their own speed, change lanes, or pass. A relatively satisfactory operating speed is still obtained.	0.71- 0.80
D	Level of Service D approaches unstable flow, with tolerable operating speeds being maintained though considerably affected by changes in operating conditions. Fluctuations in volume and temporary restrictions to flow may cause substantial drops in operating speeds. Drivers have little freedom to maneuver, and comfort and convenience are low, but conditions can be tolerated for short periods of time.	0.81- 0.90
E	Level of Service E cannot be described by speed alone, but represents operations at even lower operating speeds (typically about 30 to 35 mph) than in Level D, with volumes at or near the capacity of the highway. Flow is unstable, and there may be stoppages of momentary duration.	0.91- 1.00
F	Level of Service F describes forced flow operation at low speeds (less than 30 mph), in which the freeway acts as storage for queues of vehicles backing up from a restriction downstream. Speeds are reduced substantially and stoppages may occur for short or long periods of time because of downstream congestion. In the extreme, both speed and volume can drop to zero.	1.00+

/a/ Capacity is defined as Level of Service E.

SOURCE: Environmental Science Associates, Inc. from information in the Highway Capacity Manual, Special Report 87, Highway Research Board, 1965.

APPENDIX E

COMPARISON OF CUMULATIVE IMPACT ASSESSMENT METHODOLOGIES

The following material replaces Appendix E, Cumulative Impact Analysis Methodology, pages A-52 to A-60 in the DEIR:

"Cumulative analysis in this report is based upon approximately 19 million square feet of net new downtown office space. This includes projects as of March 10, 1984 that are under formal review by the Department of City Planning, approved or under construction within the greater downtown area. The process used to develop the cumulative list and the list of projects appears in Appendix F, pages **A-61 - A-70A** of this document. This list contains the most recent cumulative development projections prepared by the Department.

"Cumulative analysis of the traffic and transit impacts of the project use the cumulative analysis forecast approach methodology developed for the Downtown Plan Draft EIR (DEIR published March 16, 1984). The Downtown Plan forecast approach presents a cumulative scenario for C-3 district (downtown core) land use change, employment growth and residence patterns between 1984 and 2000. The forecasts are based on analysis of policies affecting the size, cost and location of new development, in the context of underlying local and regional economic conditions influencing the need for space.

"Table E-1, page A-53 highlights the differences between the list-based approach and the Downtown Plan approach. Generally, the basic difference is that the Downtown Plan approach accounts for changes to a range of land uses as well as changes over time in worker characteristics and behavior, while the list-based approach is limited to known projects of certain types and assumes unchanging characteristics and behavior. These two approaches are alternative means of assessing the future cumulative context for downtown development. They use different available data sources and information and different assumptions.

"The two approaches start with estimates of building development. As of March 10, 1984, the City's list of cumulative office development in the greater downtown San Francisco included the net addition of 19.9 million square feet of office and retail space in the

TABLE E-1

COMPARISON OF CUMULATIVE IMPACT ASSESSMENT METHODOLOGIES

	Downtown Plan Forecast Approach	List-Based Approach
Focus of Impact Assessment	• Impacts of C-3 District land use and and employment within context of rest of City and region	• Impacts of land use and employment in the greater downtown area (including C-3 District and adjacent areas) within context of rest of City and region
Timeframe	• 1984 base year	• 1984 base year
	• Changes in C-3 District land use and employment forecast to occur between 1984 and 2000	• Changes in greater downtown land use and employment determined by build-out of March 10, 1984 List of Cumulative Office Development In Downtown San Francisco. (Although no date is attached to this build-out, it could occur between 1990 and 2000)
Land Use	• 1984 base year includes all land uses	• 1984 base year includes all land uses
	• Incorporates changes over time in office, retail, hotel, industrial, and all other C-3 District space	• Incorporates net additions of office and retail space in greater downtown area as shown on the List
	• Reflects changes in response to market demands for space within context of C-3 District planning policies	• Reflects changes as a result of development of projects on the List
	• Incorporates new construction, demolitions, and conversions for all land uses	• Incorporates new construction and demolition of office and retail space and conversions to office and retail uses as included on the List
	• Incorporates more intensive use of space (both existing and new) over time. (e.g. employment density for management/technical office is 276 gross sq. ft. of occupied space per employee in 1984 and 267 gross sq. ft. per employee in 2000)	• Intensity of use of space does not change over time. (e.g. employment density for management/technical office is always 276 gross sq. ft. of occupied space per employee)
Employment	• 1984 base includes all C-3 District employment	• 1984 base includes all employment in the greater downtown area
	• Changes over time incorporate increases and decreases in all types of permanent employment directly associated with a land use, in building maintenance/security employment, and in construction employment	• Changes over time incorporate the growth of office and retail employment as a result of development of the projects on the List
Residence Patterns and Housing	• Residence patterns change over time reflecting changing regional labor force, housing market, employment and transportation factors. (e.g. the percentage of C-3 District management/technical office workers living in San Francisco is currently 49% and would decline to 44% in 2000)	• No change in residence patterns from current conditions (e.g. the current 49% of C-3 District management/technical office workers living in San Francisco is assumed to continue to apply)
Transportation	• Trip generation has been adjusted to account for travel between buildings (such as between office and retail uses) which does not leave the downtown	• No adjustment made to trip generation; all trips for buildings on the List counted as new travel in or out of downtown
	• Modal split changes over time reflecting capacity improvements, changing residence patterns, and behavior adaptations	• No changes from current modal splits are assumed
	• Includes growth of local and regional non-C-3 District travel	• Local and regional non-C-3 District travel assumed to remain constant at 1984 levels except for addition of travel due to development of the projects on the List
Key Reference	• Downtown Plan Draft EIR, EE81.3, March 16, 1984	• Transportation Guidelines for Environmental Impact Review: Transportation Impacts, September, 1983

greater downtown area. Over the 1984-2000 period, a net addition of 21.7 million square feet of space is forecast for the C-3 district under the Downtown Plan.

"The project site is within a C-2 district and, therefore, not comparable to Downtown Plan estimates of cumulative development. The project (142,000 square feet of office and retail space) would represent less than 1% of the total net additional space in projects on the cumulative list.

"Although the Downtown Plan EIR was prepared for the downtown core, it is assumed that this zoning district would represent an average condition that would be similar for outlying downtown areas. (The project site is located in a C-2 district, six blocks north of the northermost C-3 district boundary.) Therefore, data based on the Downtown Plan EIR is also presented for informational purposes only and as a supplement to the list-based approach for cumulative analysis of downtown office growth and regional housing impacts."

APPENDIX F
CUMULATIVE OFFICE DEVELOPMENT IN DOWNTOWN SAN FRANCISCO

The following appendix replaces Appendix F, Cumulative Development, pages A-61 to A-70 in the DEIR:

"Process Used to Develop the Cumulative List of Office Projects In Downtown San Francisco:

"The attached list of office and retail projects was prepared as a background document for a land use-based method of analyzing cumulative impacts. A land use-based cumulative analysis is one of the two methods of cumulative analyses suggested by the State CEQA Guidelines (Section 15130(b)(1)(A)), whereby a list of related projects is used to determine the combined effects of the whole and to determine the contribution of a proposed office or retail project to the overall cumulative effect. This is only one method of determining cumulative impacts. The other method of determining cumulative impacts is an analysis based on estimates of total employment projected for the area. This latter method is permitted by State Guidelines Section 15130(c)(1)(B) if the employment projections are based on an appropriate planning document.

"The attached cumulative list is an expanded version of past lists and includes all office and large retail projects proposed, approved, under construction and recently completed in the greater downtown area which have active applications in the Department of City Planning. This list is appropriate for use only in a land-use based analyses of the cumulative impacts of office/retail projects in the greater downtown.

"Relevant Redevelopment Agency projects have been included in the list. The Rincon Point/South Beach Redevelopment Area includes four projects: 77,000 sq. ft. of office space at 181 Steuart Street, 200,000 sq. ft. of office space on First Street, and a 30,000-sq.-ft. office building, all in at least preliminary negotiation stages between the Agency and potential developers; and 453,000 sq. ft. of office space proposed by the U.S. Postal Service at the Rincon Annex site (Source: San Francisco Redevelopment Agency). The listing for the Yerba Buena Gardens in the YBC Redevelopment Area includes 1.2 million sq. ft. of office space in the Olympia and York proposal (Source: San Francisco

Redevelopment Agency). Other office buildings in the YBC and applicable parts of the Western Addition Redevelopment Areas are listed under individual building names or addresses, based on information obtained from regular contact with redevelopment agency staff. Other jurisdictions are also contacted when the cumulative list is updated: the new 293,000-sq.-ft. State Office Building under construction at Van Ness and McAllister is included; no Federal office space is proposed in downtown San Francisco in the near future other than that at the Rincon Annex Post Office site in the Rincon Point Redevelopment Area, (Source: John Scales, General Services Administration, telephone conversation, April 11, 1984).

"Hotel projects have not been included in the list because hotel uses have different peaking characteristics from office buildings and generally do not significantly affect peak-hour traffic or transit and therefore also do not contribute to effects such as maximum production of air pollutants (see 135 Main Final Supplemental EIR, EE81.61, certified November 30, 1982, p. 150). Residential projects have not been included because residential uses are extremely limited in the study area and generally are unrelated to office uses. Residential travel in the downtown usually takes place in the contra-commute direction during peak hours and thus does not contribute to cumulative traffic or transit congestion. In addition, office trips in the p.m. peak period are assumed to be made by workers traveling to their residences. Trip generation calculated for residential uses includes persons returning to their homes after work in the p.m. peak. Inclusion in the cumulative analysis of residential uses in downtown San Francisco would double count project-generated travel: once when employees left their office building and again when they arrived at their residence if they lived in the downtown area.

"Approximately 1.3 million sq. ft. of office space is proposed for locations outside the greater downtown area. All but two of these projects (San Francisco Executive Park just east of U.S. 101 near the southern border of San Francisco, proposed for about 1.1 million sq. ft., and St. Mary's Medical Office Building on Shrader at Fulton, proposed to be about 90,000 sq. ft.) are under 10,000 sq. ft. These projects are not included on the cumulative list because their impacts do not accumulate measurably with office space in the downtown area. Although the Executive Park proposal would contribute to the auto traffic on U.S. 101, the critical analysis points for p.m. peak-period cumulative downtown traffic on U.S. 101 are the freeway entrances near downtown, the approaches to the Bay Bridge, and the Alemany interchange which restricts southbound U.S. 101 traffic on the p.m. peak period. Executive Park traffic would not contribute measurably to peak demands on freeway entrances near downtown or peak direction at peak period impacts on the Alemany interchange and is factored in as part of the traffic approaching the Bay Bridge before cumulative downtown development is added. (Executive Park Subsequent DEIR, EE81.197E, September 9, 1983. Note that an EIR was prepared in 1976 for a project on this site; following permits for four of the proposed office buildings, the developer made major changes in the project that necessitated a new EIR which is now in progress.)

"The Department's Master Project Log contains listings for projects which are no longer active for various reasons, such as no action by project sponsor in over one year, application withdrawn by sponsor, or project proposal revised to non-office or non-retail uses (examples of these projects include 272 Sutter, approximately 65,000 sq. ft., withdrawn by sponsor; 2nd and Harrison, 49,000 sq. ft., application revised from office space to parking lot). Some of these files have not been formally closed due to other higher staff priorities; however, the projects are not included on the cumulative list when staff assigned have concluded that the office project has been abandoned or withdrawn or the scope or nature of the proposal is so uncertain as to be not reasonably foreseeable.

"In EIRs prepared during the latter half of 1983, the list used for cumlative analyses included a section labeled "Completed But Not in Base Case." As of the end of 1983, that list totaled over 6 million sq. ft. of office space and about 225,000 sq. ft. of retail space (see Table F-1, Projects Completed Before 1984, p. **A-64** of this document). These projects were included on earlier lists even though they were built and fully or partially occupied because some of the baseline data (measurements of the existing situation) for some transportation systems was collected in about mid-1982 and thus could not include the effects of these projects. The baseline has recently been updated to reflect 1984 for use in the Downtown Plan Draft EIR. Projects completed before 1984 are included in this updated baseline data. Using 1984 as the existing baseline situation means that projects completed by the end of 1983 should be omitted from the list of projects used for cumulative analysis in order to avoid counting effects of the projects twice. Because some of the baseline data previously used was collected more recently than mid-1982, list-based cumulative analyses overestimated some reported impacts by measuring the effects of office buildings as part of the baseline existing situation and by including the same office building in the calculations of future cumulative impacts. For example,

TABLE F-1

PROJECTS COMPLETED BEFORE 1984

			Office (Gross Sq. Ft.)		Retail (Gross Sq. Ft.)		
Assessor's Block	Case No.	Project Name	Total New Constr.	Net New Constr.	Total New Constr.	Net New Constr.	Date Occupied
		Completed But Not In Base Case Analysis					
106	81.415ED	1299 Sansome	41,000	41,000	3,500	3,500	1983
141	81.151EV	100 Broadway	13,000	13,000			1983
163	EE81.1	901 Montgomery	63,000	63,000	18,800	18,800	1983
164	81.631D	847 Sansome	23,750	23,750			1983
164	81.251D	936 Montgomery	21,500	11,500			1983
196		736 Montgomery	40,000	40,000			1983
196	CU79.49	Pacific Lumber Co.	92,000	92,000			1983
206	81.165D	401 Washington/Battery	13,200	13,200	1,800	1,800	1983
228	81.610ED	569 Sacramento (C)	19,000	19,000			1983
237	DR80.6	353 Sacramento (Daon)	277,000	251,000	8,300	-2,000	1983
240	DR80.16	550 Kearny (Addition)	71,400	71,400			1983
263	CU79.12	101 California	1,265,000	1,257,000	24,700	-14,300	1983
287	81.550D	Sloane Building (C)	125,300	125,300	30,000	30,000	1983
292	DR79.13	Crocker National Bank	676,000	495,000	86,000	54,000	1983
312	EE79.370	50 Grant	90,000	90,000			1983
313	EE77.257	Nieman Marcus			143,000	128,000	1982
351	DR79.133	10 U.N. Plaza	92,050	92,050			1983
738	SFRA	One Flynn Center	25,000	25,000			1983
762	SFRA	Opera Plaza (M)	50,000	50,000			1983
3518	81.483V	291 10th St.	25,700	25,700		-25,700	1983
3702	EE81.25	1155 Market/8th	138,700	138,700	8,800	8,800	1983
3708	DR80.34	25 Jessie/Ecker Square	111,000	111,000			1983
3709	DR80.36	Five Fremont Center	791,200	722,200	35,000	17,300	1983
3712	DR79.11	Federal Reserve	640,000	640,000			1983
3717	EE78.413	150 Spear	330,000	330,000			1983
3718	DR79.12	Pacific Gateway	540,000	540,000	7,500	7,500	1983
3724	SFRA	Yerba Buena West	335,000	335,000			1983
3732	81.548DE	466 Clementina (C)	15,150	15,150			1983
3735	SFRA	Convention Plaza	339,000	339,000			1983
3735	SFRA	Planter's Hotel (C)	20,000	20,000			1983
3752	EE77-220	Office Bldg. (YBC SB-1)	11,000	11,000			1983
3763	81.287V	490 2nd at Bryant (C)	40,000	40,000			1983
3763	81.381	480 2nd at Stillman (C)	35,000	35,000			1983
3763	32.38EVD	400 2nd & Harrison	71,500	49,500			1983
3776	81.693EV	539 Bryant/Zoe	63,000	63,000			1983
TOTAL			6,504,450	6,188,450	367,400	227,700	

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* (C) - Conversion (generally industrial and/or warehouse to office)
(M) - Mixed Use (office/residential/commercial)

SOURCE: Department of City Planning.

PG&E is already serving office buildings completed in 1982 and 1983; including those buildings in calculations of future cumulative energy demand would count them twice. Therefore, for some part of the cumulative analyses, omitting projects completed by 1983 will provide more realistic predictions of future conditions.

"The Department is aware of a proposal for the Southern Pacific property near China Basin, called "Mission Bay." The application for environmental review for that project has been withdrawn; no other applications have been filed. The project is too speculative to analyze; intensity, density and types of uses have not yet been determined by the developer. Parts of the developer's original proposal would require major rezoning and amendment of the City's Comprehensive Plan. Further, two San Francisco Supervisors have proposed that the City acquire the property, and one neighborhood has prepared a development plan quite different from that withdrawn by the developer. Without more settled decisions about this property, it is not reaonably foreseeable to include it in the cumulative list analysis.

"The Department of City Planning is in the process of preparing plans and environmental analyses for several areas in or near the downtown. Because these plans involve only proposals for zoning and other land use controls, they are not properly part of any cumulative list. Although analyses for these plans sometimes predict amounts of office space that could be built in the area being studied, the predictions are for purposes of assessing impacts of the plans and in no way reflect proposed future development.

"Use of the Department's list for estimating cumulative impacts builds in certain limitations. It assumes, for example, that all proposals will be built at essentially the size proposed and that all buildings once built will be fully occupied. It is important to note that the cumulative list has not been adjusted to reflect temporary limitations on growth impacts by the City's actions to establish a Special Use District in the South of Market and a moratorium on new office and hotel space over 50,000 sq. ft. Nor has any adjustment been made to account for reduced building potential as proposed in the Downtown Plan (base FAR of 14:1 reduced to 10:1). Thus, the total square impacts based on the square footages may also in overestimated, if some buildings are not built, not fully occupied, or reduced in size."

TABLE F-2: CUMULATIVE OFFICE DEVELOPMENT IN DOWNTOWN SAN FRANCISCO

DOWNTOWN OFFICE PROJECTS UNDER FORMAL REVIEW
March 10, 1984

			Office (Gross Sq. Ft.)		Retail (Gross Sq. Ft.)	
Block	Case No.	Project Name	Total New Constr.	Net New Constr.	Total New Constr.	Net New Constr.
59	83.177E	1620 Montgomery	82,270	45,390		
110	82.129E	1000 Front	139,000	139,000	3,000	3,000
112	83.447E	1100 Sansome	55,000	48,000		
113	82.418E	1171 Sansome	30,000	30,000		
113	8264603	220 Green	3,520	3,520		
130	83.612C	1558 Powell	2,500	2,500		
136	83.476V	962 Battery	15,000	15,000		
192	83.412ED	1055 Stockton			81,500	66,500
194	83.128E	732 Washington	17,500	17,500	11,240	11,240
195	82.643E	660 Washington	3,938	3,938		
227	82.463E	505 Montgomery	327,300	300,670	12,100	-4,775
228	83.422E	560 Sacramento	48,000	31,000		
229	83.222EC	Embarcadero West	575,000	382,000	9,000	9,000
236	82.511E	222 Front	40,250	33,400	3,250	-0-
258	82.421E	Pine/Kearny	186,000	186,000	6,750	6,750
266	83.420ED	98 Battery	169,000	106,500		
267	83.421ED	225 Pine	134,000	134,000		
287	83.91ED	237 Kearny/Bush	99,600	87,800	6,100	2,400
288	83.148E	665 Bush (M)	12,400	2,600		-2,700
309	83.333E	212 Stockton	32,220	15,885	21,700	16,200
326	8312187	156 Ellis	3,200	3,200		
327	82,445E	Stockton/O'Farrell	43,300	25,750	57,950	28,000
331	81.448E	Mixed Use Devel.	50,000	50,000	70,000	49,000
336	83.21ECV	440 Turk	25,000	8,150		
642	83.218V	1699 Van Ness	20,000	20,000		
814	81.540E	101 Hayes	132,000	132,000	6,000	6,000
3526	83.475V	530-550 9th	42,300	42,300		
3702	83.196E	1169 Mkt, Trinity	820,000	805,000	40,000	40,000
3704	83.404	901 Mkt Penney's	145,500	126,000	80,000	80,000
3705	83.314E	5th and Market	880,000	778,000	120,000	40,000
3707	SFRA	YBC Office Bldg	593,000	593,000		
3708	81.297ED	562 Mission	405,000	265,000	10,000	10,000
3708	83.75E	49 Stevenson	169,600	136,900	9,800	-2,900
3721	83.331E	100 First @ Mission	348,920	342,000		
3721	83.40EZD	524 Howard	279,000	279,000	15,000	15,000
3735	83.313E	35 Hawthorne	47,400	47,400	2,900	2,900

(continued on next page)

TABLE F-2

DOWNTOWN OFFICE PROJECTS UNDER FORMAL REVIEW (cont.)

			Office (Gross Sq. Ft.)		Retail (Gross Sq. Ft.)	
Block	Case No.	Project Name	Total New Constr.	Net New Constr.	Total New Constr.	Net New Constr.
3736	83.311E	299 2nd @ Folsom	206,000	171,000	10,000	10,000
3744	84.41E	Hills Bros	635,000	535,000	40,000	40,000
3749	83.464EV	50 Guy Place	17,500	17,500		
3752	83.310E	837 Folsom	200,000	200,000		
3769	83.213EV	59 Harrison	113,500	49,750		
3776	83.451E	501 Bryant	67,000	35,000	14,000	4,000
3778	83.547E	775 Bryant	27,890	27,890	3,675	3,675
3786	82.33E	655 5th/Townsend	126,250	126,250		
3786	83.272EV	525 Brannan	13,500	13,500		
3788	82.352EV	640 2nd	39,100	37,400		
3789	82.31EV	615 2nd/Brannan (C)	90,000	70,000	9,300	9,300
3794	83.545V	139 Townsend	51,200	50,000		
3923	81.491EVF	1550 Bryant	80,600	49,600		
	SFRA	Yerba Buena Gardens (buildings not listed individually)	1,340,000	1,340,000		
	SFRA	Rincon Point/S.Beach	760,000	760,000		
			=======	=======	=======	=======
TOTAL UNDER FORMAL REVIEW			9,744,260	8,721,295	643,265	442,590

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* (C) - Conversion (generally industrial and/or warehouse to office)
(M) - Mixed Use (office/residential/commercial)

TABLE F-2 (cont.)

MAJOR DOWNTOWN OFFICE PROJECTS; APPROVED, NOT YET UNDER CONSTRUCTION

March 10, 1984

			Office (Gross Sq. Ft.)		Retail (Gross Sq. Ft.)	
Block	Case No.	Project Name	Total New Constr.	Net New Constr.	Total New Constr.	Net New Constr.
65	82.168V	990 Columbus	12,000	12,000		
112	81.258	Ice House (C)	209,000	209,000		
164	81.583D	50 Osgood Place	22,500	22,500	9,100	9,100
176	83.229E	801 Montgomery	31,800	31,800	6,200	6,200
176	82.368E	900 Kearny	25,000	25,000	5,000	5,000
225	81.403ED	814 Stockton	3,500	3,500	3,300	3,300
265	81.195ED	388 Market at Pine (M)	234,500	85,500	10,000	-8,500
268	81.422D	250 Montgomery at Pine	105,700	65,700	8,000	8,000
271	83.13E	582 Bush	18,100	18,100	800	800
288	81.687ED	222 Kearny/Sutter	150,000	49,950	10,000	-8,400
294	82.87D	44 Campton Place	7,600	7,600		
642	82.224VEC	1750 California	82,525	82,525		
669	81.667ED	1361 Bush	13,000	13,000		
671	82.24V	1581 Bush (C)	16,000	16,000		
690	SFRA	Post/Van Ness	88,000	88,000		
716	81.581ED	Polk/O'Farrell (M)	61,600	61,600	22,400	22,400
818	83.94EV	583-591 Hayes (C)	4,900	4,900		
3504	82.137V	44 Gough (C)	30,000	30,000		
3702	81.549ED	1145 Market	137,500	108,500	8,000	8,000
3705	80.315	Apparel Mart III	332,400	332,400		
3707	81.492ED	90 New Montgomery	124,300	124,300	3,350	3,350
3707	81.245DA	New Montgomery Pl.	227,500	209,700	2,200	-3,900
3708	81.493ED	71 Stevenson	324,600	324,600	6,200	6,200
3709	81.113ED	Central Plaza	353,100	136,300	17,400	17,400
3717	81.183E	123 Mission	342,800	342,800		
3724	81.102E	Holland Ct. (C)	27,850	27,850		
3729	82.86D	774 Tehama	5,800	5,800		
3733	EE81.2	868 Folsom	65,000	65,000		
3733	82.29E	832 Folsom	50,000	50,000		
3735	SFRA	75 Hawthorne (C)	61,900	61,900		
3738	DR80.5	315 Howard	294,000	294,000	3,200	3,200
3749	EE81.18	Marathon - 2nd & Folsom	686,700	686,700	35,300	35,300
3750	82.241E	600 Harrison	228,000	228,000	10,000	10,000
3750	82.77V	642 Harrison (C)	54,400	45,900		
3764	82.591E	Second St. Sq. (C)*	333,000	263,000	25,000	25,000
3775	81.147V	338-340 Brannan (C)	36,000	36,000		
3776	EE81.59	Welsh Commons (M)	55,600	55,600	12,000	12,000
3788	81.296Z	690 2nd/Townsend (C)	16,600	16,600	16,000	16,000
3789	81.552EV	625 2nd/Townsend (C)	157,000	157,000		
3794	81.569EV	123 Townsend	104,000	49,500		
3794		155 Townsend	19,000	19,000		
3803	81.244D	China Basin Expansion	196,000	196,000		
9900	81.63E	Ferry Building Rehab	309,500	97,500	163,500	124,000
			=========	==========	=========	=======
TOTAL APPROVED			5,658,275	4,760,625	376,950	294,450

TABLE F-2 (cont.)

MAJOR DOWNTOWN OFFICE PROJECTS UNDER CONSTRUCTION
March 10, 1984

			Office (Gross Sq. Ft.)		Retail (Gross Sq. Ft.)	
Block	Case No.	Project Name	Total New Constr.	Net New Constr.	Total New Constr.	Net New Constr.
58	82.234E	Roundhouse (C)	45,000	45,000	3,000	3,000
136	81.243E	955 Front/55 Green	50,000	50,000		
143	81.353ED	1000 Montgomery (C)	39,000	39,000		
146	83.99EC	644 Broadway	42,800	42,800		
161	DR80.191	Mirawa Center	36,000	36,000	30,650	30,650
166	DR80.15	750 Battery	105,400	105,400	12,800	12,800
166	CU81.7	222 Pacific at Front (C)	142,000	142,000		
167	SFRA	Golden Gateway III	103,000	103,000		
176	81.673EACV	Columbus/Pacific(Savoy)	49,000	49,000	22,000	22,000
208	81.104EDC	Washington/Montgomery (M)	235,000	233,300	4,000	-1,200
227	EE80.296	Bank of Canton	230,500	177,500		-800
239	DR80.1	456 Montgomery	160,550	160,550	24,250	24,250
240	81.705ED	580 California/Kearny	329,500	260,000	6,500	6,500
261	81.249ECQ	345 California (M)	640,000	466,500	15,500	15,500
262	81.206D	130 Battery	41,000	41,000		
270	81.175ED	466 Bush	86,700	86,700	7,800	2,200
271	81.517	453 Grant	27,500	27,500	6,200	6,200
288	81.461EC	333 Bush (Campeau)(M)	498,400	458,100	20,900	20,900
288	DR 80.24	101 Montgomery	264,000	234,000	4,900	-14,100
289	81.308D	One Sansome	603,000	603,000	7,000	7,000
311	82.120D	S.F. Federal	246,800	218,850	1,600	-9,440
351	DR79.24	Mardikian/1170 Market	40,000	40,000		
641	82.200CV	1735 Franklin (C)	8,600	8,600		
672	SFRA	Wealth Investments	104,500	104,500		
743	SFRA	Van Ness/Turk (Vanguard)	85,000	85,000		
767	STATE	State Office Building	293,300	293,300		
816	82.212ED	300-350 Gough (M/C)	16,000	16,000		
834	82.603E	25 Van Ness (C)	101,800	42,800	36,400	36,400
3512	82.14	Van Ness Plaza	170,000	170,000	6,000	6,000
3715	82.16EC	121 Steuart	33,200	33,200		
3715		141 Steuart	80,000	80,000		
3717	EE79.236	101 Mission	219,350	219,350		
3717	EE80.349	Spear/Main (160 Spear)	279,000	279,000	7,600	7,600
3717	82.82D	135 Main	260,000	260,000	4,000	4,000
3722	81.417ED	144 Second at Minna	30,000	30,000		
3741	82.203C	201 Spear	229,000	229,000	5,200	5,200
3787	81.306	252 Townsend at Lusk	61,000	61,000		
TOTAL UNDER CONSTRUCTION			5,985,300	5,530,950	226,300	184,660
GRAND TOTAL ALL PROJECTS			21,388,430	19,012,870	1,246,515	921,700

TABLE F-3

MAJOR OFFICE BUILDING CONSTRUCTION IN SAN FRANCISCO THROUGH 1983. (GROSS SQUARE FEET)

Year	Total Gr. Square Ft. Completed	5-Year Total	5-Year Annual Average	Cumulative Total All Office Bldgs Completed	Cumulative Total Downtown Office Buildings
Pre-1960		(Net)a	(Net)a	28,145,000(b)	24,175,000(c)
1960	1,183,000				
1961	270,000				
1962	--				
1963	--				
1964	1,413,000				
		2,866,00	573,200		
1960-1964		(2,580,000)	(516,000)	30,725,000	26,754,000
1965	1,463,000				
1966	973,000				
1967	1,453,000				
1968	1,234,000				
1969	3,256,000				
		8,379,000	1,675,800		
1965-1969		(7,541,000)	(1,508,000)	38,266,000	34,295,000
1970	1,853,000				
1971	---				
1972	1,961,000				
1973	2,736,000				
1974	2,065,000				
		8,615,000	1,723,000		
1970-1974		(7,753,000)	(1,550,000)	46,019,000	42,048,000
1975	536,000				
1976	2,429,000				
1977	2,660,000				
1978	---				
1979	2,532,000				
		8,157,000	1,631,400		
1975-1979		(7,341,000)	(1,468,000)	53,360,000	49,389,000
1980	1,284,000				
1981	3,029,000				
1982	3,771,000				
1983	4,108,000				
		12,192,000(d)	3,048,000(d)		
1980-1983		(10,972,800)	(2,743,200)	65,552,000	60,144,000

TABLE F-3
(continued)

/a/ Net equals 90% of gross. Net new space is added at an increase factor of 90%, since it is assumed that space equal to 10% of a new building is demolished to make land available for the new replacement building.
/b/ Source: San Francisco Downtown Zoning Study, Working Paper No. 1, January 1966, Appendix Table 1, Part 1. For pre-1965, data include the area bounded by Vallejo, Franklin, Central Skyway, Bryant and Embarcadero. Also includes one-third of retail-office mixed use. For post-1964, data include the entire city.
/c/ Gross Floor Space for downtown offices are included for the following functional areas: Financial, Retail, Hotel, Jackson Square, Golden Gateway, Civic Center, South of Market, and Outer Market Street as defined in the cited January 1966 report. For post-1964, the entire area east of Franklin St. is included.

/d/ Four-year total and average.

SOURCE: Department of City Planning, July 18,1984.

APPENDIX G
RESIDENCE PATTERNS AND HOUSING

The following material replaces Table G-1 and Table G-2 pf Appendix G, Employment, Housing and Fiscal, pages A-71 to A-73 in the DEIR.

"This appendix describes the methodologies for estimating residence patterns for the project and for cumulative development in downtown San Francisco. There is one method for estimating residence patterns for the project; there are two methods for estimating residence patterns associated with cumulative development. The background on these latter two approaches is presented in Appendix E, Comparison of Cumulative Impact Assessment Methdologies.

"Estimating Residence Patterns for the Project

"For the purposes of cumulative impact analysis, the residence patterns for the project are estimated for the year 2000. The assumption is that although the project is outside the downtown core (C-3 district). the project would have characteristics similar to the average characteristics for all similar buildings in the C-3 district in 2000.

"The first step is to estimate employment in the project. The year 2000 employment densities developed in the Downtown Plan analysis for management/technical office space (267 gsf per employee) and retail space (350 gsf per employee) are applied to the net additional space in the project in each of these use categories.[1] (In some projects the net additional retail space may be a negative number.)

"In the second step, the number of these workers who would live in San Francisco and other areas of the region are estimated using the year 2000 distribution of C-3 district management/technical office workers and retail workers by place of residence. The residential distribution for office workers in the project would be: San Francisco - 44%, East Bay - 35%, Peninsula - 11%, and North Bay - 10%. For retail workers, the distribution would be: San Francisco - 75%, East Bay - 12%, Peninsula - 10%, North Bay - 3%.[2] The total estimate of workers in the project who would live in each area of the region is the sum of the office and retail estimates in each area.

"Estimating Residence Patterns for Cumulative Development

"Two residence patterns forecasts are used in the cumulative impact analysis. The first is from the Downtown Plan analysis of C-3 district development and employment growth to the year 2000. The C-3 district forecasts presented in this project EIR Supplement are the result of the methodology and procedures used in the Downtown Plan analysis to forecast changes over time in the residential distribution of C-3 district workers. No new calculations were undertaken for the purposes of this Supplement. The second residence patterns forecast involved a set of calculations to establish both a 1984 base year estimate and future estimates for projects on the list of cumulative office development. These are described below.

"Downtown Plan Approach

"The residence patterns for all C-3 district employees in 2000 were forecast for the Downtown Plan Draft EIR. These forecasts are summarized in the DEIR Supplement Section IV.B, Housing (see Table 4A, page 25 of this document). The methodologies for forecasting C-3 district employment and residence patterns are described in Appendices H and I of the Downtown Plan Draft EIR.[3] Table I.10 on page I.38 of the Downtown Plan Draft EIR shows the residence patterns percentages applied to employment in each land use (or business activity). The resultant distribution for all workers by place of residence is as follows: San Francisco - 50%, East Bay - 29%, Peninsula - 13%, and North Bay - 8%.

"List-Based Approach

"The methodology for estimating residence patterns for workers associated with the list of cumulative office development in the downtown area is based on applying factors describing current conditions to the increment of office and retail space included in projects on the list. The factors and data describing current conditions for employment densities and the distribution of workers by place of residence are presented in the Department of City Planning document Transportation Guidelines for Environmental Impact Review: Transportation Impacts (hereinafter Transportation Guidelines), published in September 1983. The data in the Transportation Guidelines are based on analyses of the C-3 district Employer and Employee Surveys conducted for the Downtown Plan Draft EIR, and a similar survey conducted in the South of Market/Folsom area.

"In the first step, an employment density factor is applied to the net addition of office and retail space in projects on the list. For office space the density factor is 276 gsf per employee; for retail space the density factor is 350 gsf per employee.[4]

"In the second step, projects in the South of Market/Folsom area (bounded by Folsom, Ninth, Berry and The Embarcadero) are treated differently from projects elsewhere in the downtown area.[5] The residence patterns for all workers in the South of Market/Folsom projects are estimated according to the following percentage distribution: San Francisco - 44%, East Bay - 27%, Peninsula - 16%, and North Bay - 13%.[6] The residence patterns for office workers in other projects on the list (in the C-3 district and elsewhere in the downtown area) are estimated according to the following percentage distribution: San Francisco - 49%, East Bay - 32%, Peninsula - 11%, and North Bay - 8%.[7] For retail workers in these non-South of Market/Folsom projects, the residence pattern distribution is al follows: San Francisco - 77%, East Bay - 11%, Peninsula - 10%, and North Bay - 2%.[8] The sum of all workers in each place of residence is the estimate of the increase in downtown workers living in each area due to development of projects on the cumulative list.

"This approach has a third step in order to estimate cumulative totals for the downtown workforce, comparable to the C-3 district 2000 forecasts. For residence patterns, the base year totals are the 1984 estimates as prepared for C-3 district employment for the Downtown Plan analysis, plus estimates for the other downtown areas. These latter estimates are based on order-of-magnitude employment estimates for the South of Market/Folsom area and all other downtown areas outside the C-3 district. For the 1984 base year residence patterns totals, the percentage distributions noted above (from the Transportation Guidelines) are applied to employment estimates for the South of Market/Folsom area and other downtown areas, as appropriate. The sum of the 1984 base year totals of workers living in each area of the region and the estimates for each area developed from the list of projects represents the downtown workers residing in each area in the future, accounting only for build-out of the projects on the list. Other changes both in land use and in the intensity of activity in space in the downtown area could occur over this time period. If these changes were included in the analysis, the employment estimates and the estimates of workers residing in each area of the region would be larger than shown in the text."

"[1] Downtown Plan Draft EIR, page IV.C.45 and note 30 on page IV.C.61; also see Table IV.C.2 on page IV.C.6.

"[2] Ibid., page I.38.

"[3] For a description of the employment forecast methodology, see the Downtown Plan Draft EIR, Appendix H, pages H.6-H.16. For a description of the residence patterns forecast methodology, see the Downtown Plan Draft EIR, Appendix I, pages I.8-I.30.

"[4] San Francisco Department of City Planning, Transportation Guidelines for Environmental Impact Review: Transportation Impacts, September 1983, pages 14 and 17.

"[5] See Transportation Guidelines, pages 28 and 30 for maps of the Cumulative Development Study Area and the South of Market/Folsom area.

"[6] Ibid., page 21.

"[7] Ibid., pages 11-12.

"[8] Ibid., page 17."

APPENDIX H

The following Table replaces the Air Quality Table on pages A-76 to A-77 of the DEIR.

APPENDIX H

AIR QUALITY

SAN FRANCISCO AIR POLLUTANT SUMMARY 1979-1983[1]

Pollutant	Federal Standard[2]	State Standard[3]	1979	1980	1981	1982	1983
Carbon Monoxide (CO)							
1-hour average (ppm)	35	20					
Highest hourly average			20	10	8	--	--
No. of exceedances			0	0	0	0	0
8-hour average (ppm)	9	9					
Highest 8-hour average			13.8	7.5	5.3	9	5.1
No. of exceedances			1	0	0	1	0
Ozone (0_3)							
1-hour average (ppm)	.12[4]	.10					
Highest hourly average			0.08	0.09	0.07	.08	.13
No. of exceedances			0	0	0	0	1
Nitrogen Dioxide (NO_2)							
1-hour average (ppm)	None	.25					
Highest hourly average			0.16	0.17	0.11	.13	.13
No. of exceedances			4	0	0	0	0
Sulphur Dioxide $(S0_2)$							
24-hour average (ppm)	.14	.05					
Highest 24-hour average			0.034	0.018	0.016	.012	.018
No. of exceedances			0	0	0	0	0
Total Suspended Particulate (TSP)							
24-hour average (ug/m^3)	260	100					
Highest 24-hour average			117	173	103	106	117
No. of exceedances			1	6	1	3	4

APPENDIX H (continued)

SAN FRANCISCO AIR POLLUTANT SUMMARY 1979-1983[1]

Pollutant	Federal Standard[2]	State Standard[3]	1979	1980	1981	1982	1983
Annual Geometric Mean (ug/m^3)[5]	75	60					
Annual Geometric Mean			42.0	52.1	56.0	57.0	55.0
Annual Exceedances			No	No	No	No	No
Lead							
3-month Average (mg/m^3)	1.5	None					
Highest 3-month average			0.95	0.53	0.35	---	---
No. of exceedances			0	0	0	---	---
1-month Average (mg/m^3)	None	1.5	---	---	---	---	---
No. of exceedances	---	---	---	---	---	---	---

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[1] 1979 data collected at 939 Ellis Street. 1980-83 data collected at 900 23rd Street.

[2] Federal standard is not to be exceeded more than once per year. Annual average standards are not be exceeded.

[3] State standards are not to be equalled or exceeded. The State 1-hour average CO standard was reduced from 40 ppm to 20 ppm in 1982.

[4] The federal standard is given in terms of Expected Annual Excesses which is based on a 3-year running average.

[5] The annual Geometric Mean is a single number which applies to an entire year of data. "No" indicates TSP concentrations did not exceed 60 (ug/m^3).

Note:
ppm = parts per million
ug/mg^3 = micrograms per cubic meter
mg/m^3 = milligrams per cubic meter

Source: BAAMQD, Air Pollution in the Bay Area by Station and Contaminant, March issues, 1980-1984; and California Air Resources Board, California Air Quality Data, Annual Summaries, 1979-1982.